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ABSTRACT

In 1971 and 1972 a group of Ecuadorean evaluators planned and carried out an evaluation of the new textbooks for reading, mathematics, and sciences in the first grade classrooms of 88 schools. A field experiment was designed in which each school was assigned to a test condition: (1) obligatory use of all the textbooks and guides, (2) use of the textbooks to whatever extent deemed appropriate by the teacher, and (3) use of other textbooks or no textbooks. A pretest and posttest were administered to each student in each subject about seven nonths apart. Comparisons of schools according to urban-rural, grading type (graded, more than one grade per teacher, and one room-one teacher), and field condition were made. No significant differences were found between urban and rural schools or among field conditions in any subject area. Significant differences were found in four of nine comparisons between types of grading, and, while most of the graded schools were urban, the grading organization was more important in accounting for differences in achievement than location. A number of recommendations were made to the Ministry of Education regarding textbook revision, teacher training, and educational organization. (TO)

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ECUADOR'S FIRST GRADE TEXTBOOKS AND THEIR IMPACT ON SCHOOLS

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of Ecuador, Quito, Ecuador and
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Foreword

Working with a group of professionals from the Ecuadorean Ministry of Education has been a great opportunity for me. Dr. Manuel Valverde for his leadership, Professoras Judith de Aristazabal, Luzmila Gallardo and Piedad de Rivadeneira, Professores Gonzalo Garces and Luis Zumarraga have made a great contribution to knowledge and the improvement of education in Ecuadorean schools. The beginning of a national textbook program and national educational reform are powerful efforts to improve educational opportunity. May this evaluation serve to encourage and strengthen the ministry in its resolve to improve educational opportunity for all Ecuador's citizens.

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The Social Substantive Schedule, Robert B. Ribble and Charles R. Schultz

Prueba de Lectura, Forma "A"

Prueba de Lectura, Forma "B"

Prueba de Matematicas, Forma "A"

Prueba de Matematicas, Forma "B"

Prueba de Ciencias, Forma "A"

Prueba de Ciencias, Forma "B"

ECUADOR'S FIRST GRADE TEXTBOOKS AND THEIR IMPACT ON SCHOOLS

Background and Design of the Study

The evaluation of a textbook program for an entire nation presents opportunities as well as challenges to those who would attempt it. Evaluating the success of a textbook program by observing the change in learning of the students is not a startling idea, but to do so at the first grade for a sample of schools of a nation as ambitious and novel.

Measuring first grade achievement with a standardized test is in itself a difficult task because the tools and experience for such a task are not readily available. Textbook impact on schools in Central America has been studied by means of asking teachers, administrators, and supervisors their opinions.[1] Using a field experimental design, in which there is an attempt to control for use of textbooks was an idea which presented difficulties and might have been deemed to elegant a design for observing textbook use, but despite difficulties encountered, in most schools designated for the study the design was carried out.

The Ministry of Education of Ecuador decided in 1970 to evaluate the effectiveness of its textbook program which had been started in 1966. By 1970 distribution of the textbooks to first graders was begun. Eventually six primary grades in all schools of the nation would have official textbooks.

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[1] John E. Searles, Regional Textbook Program Survey Reports, Volumen IV, Summary of the Project, Organizacion De Estados Centroamericanos y Panama and Regional Office for Central America and Panama of the United States Agency for International Development, March, 1971.

The efficacy of textbooks has been included in the Coleman report Equality of Educational Opportunity.[2] In discussing the findings of the Coleman report, Christopher Jencks states that there was little relationship between the issuing of free textbooks and reading or mathematics scores. He suggests that the data show that where the textbooks are more recent, the students do slightly less well on verbal scores than where the textbooks are slightly older. The interpretation he suggests for this anomaly is that schools tend to provide increased access to new textbooks as a response to non-achievement. A far more important finding of the Coleman report indicated by Jencks was that when books are found in children's homes the children do far better in school than if they have no books at home.[3]

In 1970 textbooks in reading, mathematics, and science were distributed to first grades in Ecuador. The textbooks carried a nominal charge, enough to cover the costs of printing and distribution. Low as the cost was, there were, nevertheless, many poor families with several children in school who were not able to buy textbooks for their children. In such cases some schools organized the padres de familia to assist needy students in books and loaned them to the students, or were paid for the books on a month-by-month arragnement.

A committee appointed by the minister of education decided to measure the achievement of first grade children who used the textbooks, and to compare their achievement with children who did not use the books.

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[2] James S. Coleman, et. al., Equality of Educational Opportunity, 2 vols. Washington, D. C.: Office of Education, U.S. Department of Health, Education and Welfare, U.S. Government Printing Office, 1966, OE-38001; Superintendent of Documents Catalog No. FS 5.238:38001.

[3] p. 95, Christopher S. Jencks, "The Coleman Report and the Conventional Wisdom," Frederick Mosteller and Daniel P. Moynihan (eds.), On Equality of Educational Opportunity, N.Y., Random House, 1972.

A field experimental plan was decided upon which further refined the study into a comparison of the achievement of children in three kinds of treatments, to which primary schools would be assigned:

A. Those whose teachers were obligated to use the new textbooks and the accompanying teacher guides, in reading, mathematics, and science. A brief orientation was given to the teachers in condition A schools.

B. Those whose teachers would use the new textbooks if and when they desired, but would not use the teacher guides. These teachers did not receive orientation.

C. Those whose teachers would not use the new textbooks or the guides.

The first grade students were given a pre test at the beginning of a school year and post test toward the end of a school year. The interval was 6 to 7 months. They were tested in reading, mathematics, and science.

An experiment, properly speaking, would control for a number of variables, with carefully controlled conditions or treatments. In an experiment, the differences in outcome are due to the treatments. In this study the variables other than the treatments were not controlled. However the variables other than the treatments were to be controlled by means of random selection of schools. Originally, in the Sierra, seventy-two schools were selected at random from four provinces. As will be indicated, all seventy-two schools could not be used, so that random selection of the remaining schools could not be strictly observed. In the Coast, thirty-six schools were selected randomly from two provinces. In the Sierra, the four provinces were selected by random procedures from all the provinces, and two provinces of the Coast were selected by random procedures from all Coast provinces.

The schools were assigned by random procedures to one of the three conditions (A, B, or C).

Because of the impossibility to control strictly the conditions of the study and the impossibility of observing strictly random selection of schools, this study is more properly called a field experiment than an experiment.

Teachers were observed as to their style of teaching. An instrument measuring the verbal interaction of pupils and teachers designed by Professor Robert Ribble was selected and translated for this purpose. It is the "Social-Substantive Schedule," and allows an observer to classify the verbal behavior of students and teachers in a classroom, and to categorize these according to types of teacher and student responses.

In order to measure the achievement of first graders, it was necessary to design a test in each subject matter area. It was decided further to design two forms of each test so that one form could be used on the Coast and another in the Sierra. The group of researchers appointed by the minister to carry out the design agreed upon by the committee began its work in January, 1971. It found that its first task was to design the achievement tests. This was an extensive task involving field testing of items, building parallel forms, securing satisfactory correlation between the forms, and preparing the instructions for the test so that standardized testing conditions would be used in each school.

The research staff of six administered the tests in each classroom and graded each test. This team also administered the Social Substantive Schedule. This instrument and procedures associated with it will be described in a later section.

The Testing Situation

The setting of the test is more fully described by the group of Ecuadorean evaluators in this final report. Among conditions which the evaluators, including this one, observed were the following:

1. Rooms were crowded with children. The number of students in classrooms of graded (completa) schools was as high as 65. In unitaria schools there were fewer first graders but as many as 150 students assigned to a single teacher in as many as five grades.
2. Classrooms were noisy, often hot, and uncomfortable. Children often sat two and three to a desk. Teachers, in order to combat the noise from the streets, often shouted as a normal classroom voice. They were poorly lighted as well.
3. Children in many schools were observed to be malnourished. These children had all the symptoms of hunger-swollen stomachs, tiredness, listlessness, and other apparent skin or hair conditions indicating malnourishment.

These conditions were present singly or in combination in most schools. In order to standardize the testing conditions, the six members of the evaluation team administered all pre and post tests themselves, leaving the teacher in the room to assist if necessary.

The Role of the Supervisors

Supervisors who were to assist in the field experiment were brought to Quito in June, 1971, to orient them to the study thru tests to be used and to orient them to their roles in the study.

Supervisors were originally supposed to:

1. Orient teachers in schools assigned to condition "A" to the

purposes of the study and the use of the new texts and guides.

2. Orient teachers in schools assigned to condition "B" the purposes of the study, and to the use of the new texts.
3. Orient teacher assigned to condition "C" to explain the role of those classrooms in the study, and to help them in the use of other than new texts which were being used.
4. Visit the schools assigned to condition "A" to assure that teachers were using texts and guides, visit schools assigned to condition "B" to assure that the new texts were being used, and to visit schools assigned to condition "C" to make sure that the new texts were not being used. Forms were designed for supervisors to send to the evaluation team in Quito to describe each visit. The teacher was to make out a form at the same time to keep a record of the supervisor's visit and to record what the supervisor advised. The supervisors were asked to make three visits during the school year to each school in condition A, B, or C to assure that conditions were being observed.

It became apparent early in 1972 that the forms were not coming in from many supervisors in the Sierra. After checking with supervisors and provincial administrators, it became apparent that many supervisors would not, for various reasons, be carrying out their visits to the schools. They stated that they had too many other duties, travel was too difficult for as many trips as were required to some of the more remote schools of the study, or that they did not fully understand the study and its value. Based on interviews with provincial administrators and supervisors, it was considered necessary to drop twenty of the schools from the Sierra portion of the study. Fifty-two schools which supervisors had visited more regularly were kept in the study. In one of the provinces of the Coast the evaluation team took over supervision of the conditions after it became apparent that some supervisors were not carrying out the visits to the schools.

Only three of the 29 supervisors involved in the study had certification as supervisors. Certification as a supervisor requires post graduate work in an advanced normal school, but does not require university work. Most supervisors apparently are not trained beyond their teaching positions. In understanding supervisor resistance to the textbook evaluation, this factor may be crucial. Since supervisors have had little or no training as supervisors, and have never had contact with knowledge of research or evaluation, it is not surprising that some supervisors were uninterested in and uncooperative with the evaluation. Most supervisors in fact have no more training than teachers and may have had less than the better urban teachers in the graded schools.

The Role of the Technical Advisor

As technical advisor to the evaluation group the author assisted in designing the study, constructing the test, planning the data analysis, interpreting the data, and writing the final report.

The evaluation team and the advisor planned and carried out the procedures for establishing reliability of the three subject matter tests, each with two forms, one for the Coast and one for the Sierra. The test-retest reliability for each test was at least .82, with an interval of one three to five days between test applications. The test-retest reliability situations for each subject matter test was one to three classrooms in Quito and nearby rural schools.

The correlations between forms A and B (for Sierra and Coast) for each subject matter were above .75. No split half reliability coefficients were obtained.

Item analysis data were gathered for the Sierra students who took the pre test. The upper 27% were compared with the lower 27% on the total score. All items in the three tests discriminated in favor of those who were in the upper 27%.

The Plan for Analysis of the Data

The unit of analysis was the first grade classroom in each of the sampled schools. Each classroom was measured on the pre test and post test. The mean for that classroom was obtained on the pre test and the post test. The means for the pre test and post test were compared to determine if the growth was significant. The following comparisons were made:

1. The means for pre tests and post tests for urban and rural schools were compared to determine whether there were significant differences in achievement between urban and rural schools. These comparisons were made separately for Sierra, Coast, and all schools.
2. The means for pre tests and post tests for completa, pluridocente, and unitaria schools were compared to determine whether there were significant differences in achievement between the three types of schools. These comparisons were made separately for Sierra, Coast, and all schools.
3. The most important comparisons were those for the three field conditions, which were described above and are referred to henceforth as conditions A, B, and C. The means for pre tests and

post tests for schools assigned to Conditions A, B, and C were compared to determine whether there were significant differences in achievement between schools of the three conditions. These comparisons were made separately for schools of the Sierra, Coast, and all schools.

No statistical comparisons were made between Coast and Sierra schools. Significant differences referred to above indicate differences greater than those that would occur by chance. Some differences are to be expected, but small differences occur by chance. The larger the differences, the less they would be apt to occur by chance.

Pre tests were administered in the Coast provinces of Guayas and Manabi in June and July, 1972. Post tests were administered to the 36 schools in those provinces in November and December, 1972. The Sierra pre tests were administered in October and November, 1971, and the post tests were administered in April and May, 1972.

The type of evaluation undertaken was summative, which means that outcomes related to the usage were examined. However, it was possible to anticipate the need for teacher retraining during the study so that the texts could be used to better advantage. A project was begun to accomplish that in 1972. The findings could also be used when the texts were to be revised. That process of revision began in 1973 when the findings were presented.

Several unanticipated outcomes resulted from the research project, among which were the following:

1. The availability of tests which could be used to gather base data on the learning of first and second graders in the nation.

2. The development of a group of professionals associated with the ministry skilled in testing and observation of classrooms.
3. The demonstrated ability of the data processing function of the ministry of education to handle large amounts of achievement data from schools of the nation.
4. A design for testing first grade achievement became available to the ministry. Several weaknesses in the educational system in executing a design also became apparent. It is most helpful to identify such weaknesses as well as strengths so that research and evaluation functions can be aware of such characteristics and can correct for them.
5. The existence of computer programs were designed especially for the equipment in Ecuador. Among programs designed were those for item analysis of tests, test scoring, means and standard deviations for test scores, and two kinds of analysis of variance.

The Sample of Schools

Samples of Sierra and Coast schools were taken to obtain a random sample of both major sections of the country. The samples do not necessarily represent equal proportions of students in the Sierra and the Coast. The number of students in each section is not quite equal, with somewhat larger numbers of students in the schools following a Coastal year than in the schools following a Sierra year. The sample consists, however, of more schools in the Sierra than in the Coast, so it is not closely representative of Coast and Sierra student populations.

Sierra

A total of 72 schools from the 4 Sierra provinces were originally picked for the experiment, 18 from each province. Within each province, six schools were assigned to each treatment. Schools were chosen for the experiment and assigned by random procedures to each treatment. The schools which comprise this sample can be said to be a stratified non-random, or purposive sample. Random procedures were attempted but were not successful due to the lack of accurate and complete information in the Ministry. Lists of schools in the Ministry were checked against lists in the four provinces, and schools selected by random procedures were visited. Lists of schools at the provincial directorates did not accord with those in the Ministry, and visits to supposed school sites in the field often yielded the information that the schools on paper did not in fact exist. In such cases some schools had been consolidated with others, some had apparently been intended but never organized, others had apparently been closed, and some schools were unknown to provincial officials. Before a strictly random procedure could be established for choosing schools for an experiment, an accurate list of schools and types would be necessary. In this experiment 72 schools were eventually chosen and were then randomly assigned to treatment. The 72 had to be chosen by actual contact in the field and so became a purposive sample. The 72 were chosen from three types and by rural or urban location, and were selected in the Sierra in 4 provinces. Eventually, 20 schools had to be dropped due to lack of cooperation from provincial supervision.

Pre test data, however, were collected in all 72 schools, and post test data were collected in nearly all of the 72 schools. The data from the 20 schools where conditions could not be strictly controlled according to the prior agreements, and where records of supervisory visits were lacking, were dropped from the final analysis. The pre and post test data for these twenty schools were analyzed separately to determine if they systematically varied, thus creating a biased sample of the 52 schools. The final sample represents fairly accurately the proportion of schools in the area according to urban-rural, and organization such as graded (completa or pluridocente) and ungraded (unitaria).

The fifty-two schools in the final Sierra sample consist of those schools in which the members of the textbook research team feel actually followed assigned conditions.

In the Sierra 14 urban and 38 rural schools were selected. Urban schools were those within the limits of a municipality. Rural schools were those outside the limits of a municipality. Generally, the rural schools were located off transportation routes and at least 3 kilometers from populated centers.

The schools were distributed by province as follows:

Province	Urban	Rural	Total
Chimborazo	5	10	15
Imbabura	3	8	11
Loja	4	11	15
Pichincha	2	9	11
Total	14	38	52

	Field Condition	Chimborazo	Imbabura	Loja	Pichincha	Total
A	(Texts - Guides)	5	4	6	4	19
B	(Texts - No Guide)	5	2	6	2	15
C	(Other Texts)	5	5	3	5	18
Totals		15	11	15	11	52

Another analysis by type of school was made. Three types of schools are used: Completa (graded), pluridocente (more than one grade per teacher), and unitaria (one teacher in the school). The number of schools of each type is as follows:

Sierra Province

Type of School	Chimborazo	Imbabura	Loja	Pichincha	Total
Completa	6	5	6	3	20
Pluridocente	4	3	4	4	15
Unitaria	5	3	5	4	17
	15	11	15	11	52

Coast

Two coastal provinces, Guayas and Manabi, were selected by random procedures from all the coastal provinces to serve in the study. Eighteen schools in each province were chosen by random procedures. Ten of the 36 were urban and twenty-six rural.

The schools were distributed according to the variables by province as follows:

Coast Provinces

Field Condition	Guayas	Manabi	Total
A	6	6	12
B	6	6	12
C	6	6	12
Total	18	18	36
Type of Schools			
Completa	6	6	12
Pluridocente	6	6	12
Unitaria	6	6	12
Total	18	18	36
Origin			
Urban	4	6	10
Rural	14	12	26
Total	18	18	36

It was possible to assign those twelve schools of each type from the coast provinces. Further, twelve schools were assigned to each of three field conditions, so a design which called for equal numbers of schools in cells was possible for the Coast which allowed a three-way analysis of variance, using a Lindquist II model:

Number of Coast Schools of Three
Types Assigned to Field Conditions

	Completa	Pluridocente	Unitaria	Total
Condition A (New texts and guides with orientation)	4	4	4	12
Condition B (New texts without orientation	4	4	4	12
Condition C (Other texts)	4	4	4	12
Total	12	12	12	36

The Sierra and Coast Schools have been analyzed separately according to urban-rural location, type of school (completa, pluridocente, unitaria), and field condition (A - new texts and guides with orientation, B - new texts without guides or orientation, C - other texts).

The Sierra and Coast schools were then combined for comparisons as to urban and rural location. Twenty-four schools were rural and sixty-four were rural, with a total of 88 in the six Sierra and Coastal provinces.

The 88 schools were assigned to field conditions as follows:

	Number of Schools
Condition A	31
Condition B	27
Condition C	30
Total	88

The 88 schools were of the following types:

	Number of Schools
Completa	32
Pluridocente	27
Unitaria	29
Total	88

The Science test data for one of the rural schools of the Sierra were missing so the analysis of science test results applies to 87 schools in all, or to 51 schools of the Sierra.

In the selection of the original 72 schools of the Sierra, random procedures were used. The list of schools was obtained from the Ministry, four provinces were selected by random procedures, after which 18 schools were selected from each province. Once the sample was selected, the members of the research team went to the provinces to locate the schools. Several of the schools were unkonwn by supervisors or provincial authorities. Other schools had been moved to other locations or had been combined with other schools in the past several years. Schools had to be selected in place of those schools. It was clear from this experience that the list of schools in the ministry is quite out of date, and contains schools which may never have existed.

In the ministry's list of schools the identification of each school as to actual location, type (completa, pluridocente, unitaria), and sex (boys, girls) was often in error. It is understandable that these characteristics would change over a period of time for schools. But the Ministry needs to have a mechanism for keeping such data current.

In the above presentations the province is given simply to show the representation of schools across provinces by various classifications. No analysis was undertaken to determine whether pre and post test scores varied by province. Care was taken to make sure that samples did not consist of too widely differing numbers of schools. The origin (urban - rural) classification would have come closest to violating the assumption of equal variance for each of the populations from which the sample was drawn.

Most of the students in the rural schools of Chimborazo, and a large number of the students in the rural schools of Imbabura and Pichincha were of Indian origin. The students in the rural schools were of lower income class affiliation. The student body of the urban schools consisted of a larger number of lower middle class than that of the rural areas. No classification of school by racial or economic affiliation was made, however.

No comparisons of achievement were made between provinces (or between Coast and Sierra) for the pre and post tests, nor were attempts made to compare achievement by racial or economic class.

Analysis of Data

In all the analyses which follow the post test results were significantly greater than post test results. This fact will not always be mentioned for each comparison in the discussions which follow. All tables will be found in the appendix. Tables with Roman numerals contain data including means. Tables with arabic numerals contain analysis of variance information and correspond to the tables with Roman numerals. So Table IVA and 4A refer to the same data,but IVA contains the means and standard deviation. Table in the appendix contains each school in the study with that school's province, mean and standard deviation for each test.

Urban and Rural By Pre and Post Test Comparisons

The first comparisons analyzed are for the Reading tests. The comparisons of pre and post tests for urban and rural students revealed highly significant differences.

Urban and rural first graders of the Sierra (Table IA) and Coast (IB) did not differ more than by chance on their reading test means. However, combining Sierra and Coast schools (Table IC) revealed a significant interaction. The interaction arose as a result of the differences between urban and rural students on pre and post tests. There was a greater growth for all urban students than for all rural students between pre and post tests.

In the Sierra (IIA), and Coast (IIB), and for combined Sierra and Coast schools (IIC), there were no significant differences between urban and rural schools in mathematics. The differences between pre and post tests were highly significant.

Analysis of Science test scores revealed no significant differences between urban and rural schools for the Sierra (IIIA), Coast (IIIB), and combined Sierra and Coast (IIIC). Differences between pre and post test scores were highly significant, as expected.

Urban and rural differences among schools were not significant in mathematics and science. In reading the combined urban Sierra and Coast schools had a significantly larger growth between pre and post tests than the rural Sierra and Coast schools. Post test results were significantly higher than pre test results in all cases.

The reader will note that in comparing Sierra and Coast schools on the pre test scores for mathematics and science, there appeared to be differences in favor of Coast schools. There appeared to be higher reading scores in Sierra than in Coast schools. It must be noted, however, that statistical comparisons have not been made between Sierra and Coast schools. Separate forms of each test were used for each region, but the forms were highly enough correlated to be considered parallel forms. It was not the intent of the study to compare Sierra and Coast schools, and it is risky to make conclusions about differences between the two regions on the basis of the data presented.

Field Conditions by Pre and Post Test Comparisons

Sierra schools did not differ according to the three field conditions. While it was expected that condition A schools, those in which the new texts and guides were used, might have greater growth in reading than the condition B and C schools, this did not occur. Post test results for all schools were, of course, significantly greater than pre test results (Table IVA).

Coast schools assigned to conditions A and C had larger reading means than schools assigned to condition B (Table IVB).

Combining Coast and Sierra Schools did not reveal significant differences among the three field conditions (Table IVC).

In mathematics growth the schools of the Sierra and Coast did not differ significantly according to field conditions (Tables VA, VB, and VC). Post test results were greater than pre test results in all cases.

The schools assigned to conditions A, B, C did not differ in means or in growth in science achievement. (See Tables VIA, VIB, VIC). Post test scores were significantly higher than pre test scores, of course.

The main comparisons in the study were those in this section. In no case were schools using the new texts and guides superior in growth in the three subjects to schools using other texts or schools using only texts and not the guides. In reading the schools using new texts and guides and schools using other texts had higher means than the schools using the new texts without guides. In all cases post test results were significantly greater than pre test results.

The finding that using the texts and guides had no effect on growth in the three subject areas has implications which will be discussed in the section on conclusions.

Type of Schools by Pre and Post Test Comparisons

There were significant differences among types of schools in the Sierra in means of reading achievement. There was a greater growth in reading achievement between pre and post tests for completa schools than for the other two types of schools (Table VIIA). Completa schools have one teacher per grade, while pluridocente schools have more than one grade assigned to a teacher, and unitaria schools have one teacher for all grades. This would appear to be a critical variable in teaching reading. Among all schools of the Coast and Sierra, the completa schools had greater growth than other types of schools (Table VIIC).

There were no significant differences in reading means among types of schools on the coast (Table VIIB). As usual, there were significant differences between all pre and all post schools.

In the Coast provinces (Table VIIIB) unitaria and completa schools had significantly greater means in mathematics than did pluridocente schools. No such differences in mathematics means were apparent between types of schools in the Sierra (Table VIIIA) or when combining Coast and Sierra schools (Table VIIIC).

In the Sierra the test results in science showed a greater mean for completa schools than other types of schools (Table IXA). There were no significant differences in science means of Coast schools (Table IXB) or combined Coast and Sierra schools (Table IXC).

In summary, the comparisons of schools in the study by type yielded more differences than did urban-rural comparisons or comparisons by field conditions.

As in all other types of comparisons, the greatest and most consistent differences appeared between pre and post tests in all subject matter areas. Such results were to be expected. They are relevant to questions raised by certain critics of schooling such as Jencks and Ilich who have asked whether schools make a difference. Apparently schools do teach children something in reading, mathematics and science in Ecuador. It would be difficult to maintain that those students who were present in the study for both pre and post tests would have gained as much had they stayed home as they gained in school. This study did not address itself to that question, nor was it so designed. The gains observed in this study compared to a study done in Michigan of first grade achievement are certainly favorable. In that study the Stanford Early School Achievement Test was used to measure the differences between two types of programs. The mean gain in raw scores reported were 3.9 items to 5.1 items in reading, and 2.9 items to 4.2 items in mathematics. The period of time measured was from October, 1971 to May, 1972.[4]

Completa schools tended to have higher reading growth in the Sierra, and had higher means and growth in the Sierra and Coast schools combined. Completa schools and Unitaria schools had higher mathematics means than Pluridocente schools. In the Sierra the Completa schools had a higher mean than other types of schools in science. The higher means for Completa schools in the instances mentioned may be due to the fact that students get more attention from teachers, because there is one teacher per grade in the completa schools. Another possible contributory factor might be that completa children come largely from urban backgrounds where they have more and more varied verbal experiences and exposure to varieties of cultural experiences.

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[4] p. 13, Paul G. Whitmore, William H. Melching, and Edward W. Frederickson, Gain in Student Achievement As A Function of Inservice Teacher Training in Classroom Management Techniques, HumRRO Technical Report 72-26, HumRRO Division No. 5, Fort Bliss Texas, Human Resources Research Organization, October, 1972.

The contrasts between urban and rural schools did not reveal as many differences as among the types of schools. Hence it would seem that the school type with the teacher variable might be more important than location of the school in urban or rural area.

Field condition had little impact on achievement means or growth. This means that whether the new texts were used or not had little effect on means or gain for the period studied. The texts and guides were so new and the teachers so unpracticed in their use that teachers had little time or orientation to the new methods and content. The experience of school districts which adopted new mathematics and science programs showed that without adequate orientation of teachers and supervisors results were either no better in terms of pupil learning with the new program, or teachers expressed great dissatisfaction with the new programs.

After extensive orientation the teachers' estimation of the new programs rose appreciably.

The tables containing summaries of the Analysis of Variance data are numbered from 1A to 9C, and correspond with the tables numbered 1A to IXC. The tables numbered 1A to 9C are found in the appendix.

The explanation for no differences between field conditions is complex, to be sure. That new texts and guides did not elicit greater gain is a fact for which several explanations are possible. Among these are the following:

1. Teachers were unprepared to use the texts and guides, because of lack of the knowledge required in the new texts.
2. Supervisors did not encourage teachers to use the new texts and guides.
3. Teachers may be unwilling to try new methods which they view to be at variance with their training. This view may be reenforced by their principals or supervisors.
4. Teachers did not have the time to train themselves to use the new texts and guides.
5. The nature of the new texts and guides causes "stimulus overload." There is just too much for a teacher to cope with the first year if one tries to read three guides written in complex terminology, and to apply new knowledge generated by the use of texts in three subject areas. Stimulus overload means that there are too many new signals to catch, too much new language, too many new behaviors to master, too many new concepts to master within a given period of time. One subject area with a guide and a textbook can be thought of as an instructional system. Understanding that system and being able to apply its principles demands extensive time and effort. Three new instructional systems is simply too much for a teacher to master in one or perhaps even 2 or 3 years.

Comparison of Field Conditions by Type of School and Pre-Post Test Results in Coast Schools

Thirty-six schools were selected from two coastal provinces for the purpose of observing interactions among the three variables of type of school, field condition and pre-post test results. This kind of comparison was possible only where the number of schools was kept equal on type of school and field condition. The dropping of twenty schools from the Sierra sample made this kind of comparison impossible in that section of the country.

So far type of school and field condition was compared separately with pre and post test results. The advantage to a further analysis combining three variables was in observing possible interactions among the three variables. An interaction affect is one in which the main effect variables might differ in a peculiar way, not observed when one takes each main effect in turn. As an example, while schools might not differ in their mathematics achievement means, either according to type of school or according to field condition, it may happen that completa schools assigned to field condition A may have greater growth than unitaria and pluridocente schools assigned to field condition A.

Reading achievement means (Table XA) are not significantly different according to type of school, but are different according to field condition, and of course, according to pre-post test administration. Post test results in this study uniformly are significantly greater than pre test means. In the field conditions, schools assigned to type C and type A conditions are greater than those assigned to B conditions. The A condition is use of new texts and guides, and C condition is other texts.

Mathematics achievement means do not differ between schools according to type or field condition. Post test means are greater than pre test means (Table XB).

Science achievement means do not differ among schools by type or field condition. Again, the post test means are significantly greater than pre test means (Table XC).

This analysis was the most elegant and complex attempted. The one difference which appeared, by field condition in reading, was not something which yields clear cut direction for interpretation. The tables which contain the summaries of the Analysis of Variance are number 10A, 10B, 10C, and correspond to those numbered XA, XB, and XC. The analysis of variance and means summary tables are found in the appendix.

Had there been a clear indication of superiority in favor of the other text (C) schools, or text and guide (A) schools some kind of direction might have emerged from this analysis. It might be suggested that on the Coast, the teachers did a better job of teaching with guides and with old texts than those who had no guides. In any case, there appears to be no solid argument for the new textbooks from this analysis.

Table XI, in the appendix, shows the items of the pre tests answered correctly by 50% or more of students in Coast and Sierra Schools.

Textbook Material Completed as Reported by Teachers

Teachers did not use the new texts in their entirety. It is not surprising that they did not. It would have been surprising if they had, because the texts present so much more knowledge to the student than formerly was the case. The methods suggested in the guide were often viewed as edicts which could not be ignored or changed regardless of circumstances. Frequently teachers were heard saying that they did not have slides of this or that as the guide suggested so the guides could not be used. The intent of the guide and the program was to present ideas for resources and methodology which the teacher could select from and adapt to that teacher's own ends.

The data in Table XII and Table XIII (medians) are those reported by 34 teachers. These teachers reported their own data in a questionnaire. The median number of pages completed reported by the Coast teachers was 74 pages of the reading text, which was less than half the text. The median is a figure which is a point at which half the teachers are above that number and half are below. The median number of pages completed in the reading text as reported by the Sierra teachers was 130. The median number of pages of reading texts reported completed by teachers of the Sierra and Coast was 100. The reports are only a sample (and not a random sample) of the 88 teachers in this study.

In the new mathematics text the median number of pages reported completed by the Coast teachers was 102, and by the Sierra teachers 140. The median for all teachers was 123 pages.

The median number of pages completed in the new science text as reported by Coast teachers was 71 pages, and by Sierra teachers 102 pages. The median for all teachers was 73.

Sierra teachers reported completing many more pages in the new textbooks than the Coast teachers. If one examines the numbers of pages reported by individual teachers of the Sierra, there appears to be more rounding off of numbers to the nearest 5 or 10 than when one observes the pages completed by the Coast teachers (Table XII).

If one were to start with data reported on number of pages completed by Sierra teachers, one might expect that the Sierra students achieved more gain than Coast in students in the study. This study did not include a test of significance of differences between means of the Coast and Sierra, for several reasons. But if one compares the data in Tables IA through IXC one observes that most differences in achievement pre and post scores and gain scores would apparently be in favor of Coast students, and not Sierra students. The two forms for each achievement test exist in parallel forms (A & B) for the Coast and Sierra which correlated highly enough to be considered equivalent forms. Hence, the achievement data do not corroborate the Sierra teachers' claims.

It may have occurred that Sierra teachers systematically were somewhat over-optimistic about the number of pages completed. It is doubtful that the Sierra students mastered as many pages as their teachers reported. The evaluators reported that they were sure of the data reported by Coast teachers but not as confident of the data on pages reported by the Sierra teachers. It is more likely that Sierra teachers reported the number of pages that their students may have scanned, or reviewed quickly. On the other hand it is more likely that Coast teachers reported the number of pages completed which had been worked on intensively. As an average, it might seem, on the basis of evidence external to Table XII that a median number of pages completed as reported by all teachers would be a better measure than to use the Sierra median figures. The median figure for all teachers for each subject would appear to be a generous figure for an estimate of how much material teachers covered in the first year.

With more intensive training in the textbooks and guides teachers might be expected to elicit more mastery of material rather than to cover more pages. This expectation would have to be related to use of the guides, which for the first year was minimal. Teacher guides were not used widely or creatively, according to teacher opinions and observations made by the research staff. More data concerning use of guides is reported by the ministry research staff (Group B) in its final report.

Condition A schools did not differ greatly in mathematics and science from Condition B schools on median for number of pages reported to be covered. Reading appeared to be an exception, in which A schools reported more material covered.

Each textbook and its guide must be considered an instructional system, so differences between systems must be recognized. The reading and mathematics systems are used for skill development with a greater likelihood of the teacher striving to teach for mastery. The science system is designed to be more exploratory, with less emphasis upon sequence and mastery. Teachers and supervisors have mentioned frequently that the vocabulary of the three systems are not correlated, which is another way of stating that there are three instructional systems to be used, not one.

Each subject matter area has its peculiar characteristics, such as structure, sequence, presentation, feedback, and evaluation possibilities. Expecting the teachers to be equally powerful in dominating the subject matter of all three is unrealistic. Similarly, method problems are peculiar to each subject and elicit widely varying abilities among teachers.

With a corps of teachers trained in methods different from those suggested in the guides, a great problem in discontinuity of practice is present. Similarly, the philosophy of the guides represents a break with the training of the teachers. Teachers trained in subject matter to a certain degree, and trained in certain methods now have been presented with new instructional systems in which suggestions, not prescriptions are available. The guides suggest adaptation, selection from available resources and methods rather than a "one best method." This philosophy calls for a role break in the teachers and a role break on the part of the principals and supervisors. The administrators and supervisors must play a greater information-giving role, and a more resource-providing role than an evaluative or dominating role in helping teachers. If the supervisory structure does not understand this new role, the orientation of the teachers as well as the value of the new instructional systems will be small indeed.

Distributions of Scores for Schools in the Study

The distributions of the pre tests and post tests allows us to observe the shape of achievement at a glance. Figures I - XII in the appendix, show the percentage of students in schools of the study getting items correct. They are called Distributions of Paired Students of Selected Schools. Each test has fifty items.

Comparing pre test results with post test results in each subject for the Sierra and for the Coast, there is more spread in the scores in the post test than in the pre test. The single exception to this appears to be for science in the Sierra. It is to be expected that with instruction, variability, or spread in scores among students increases. That is a phenomenon which is also found with increasing number of years in school for a given group of children. The more they learn, the more differences appear among a group of children. An obvious feature of all comparisons of pre to post test results for each subject is, of course, the movement of the shape from left to right, or from fewer items correct to more items correct.

The medians in Table XIV show that there was an increase from pre test to post test for each subject matter for Sierra and Coast students. The medians also reveal that in all subjects Coast students had a higher pre test score than Sierra schools. The Sierra students had a higher post test median than the Coast students. However, no statistical test was applied to determine if differences were significant between Coast and Sierra schools. The data are on indication that the claims made by Sierra teachers to have covered more pages in the textbooks did not result in higher gains for Sierra students. Indeed, if differences were apparent, they would have tended mainly in favor of the Coast students. But it was not the aim of the study, nor worthwhile, to compare Sierra against Coast students or schools, nor was it the aim of this study to compare gains or achievement in one province with another. Means and standard deviation for each school's pre and post test in each subject appear in the appendix in Table XVII.

Distributions of Scores for Schools and Students Not in the Study

In the description of sample size at the beginning of this report, it was stated that the original sample size of the Sierra schools was 72 schools. It was stated that due to lack of proper supervision over field conditions, 20 schools had to be dropped, leaving 52 schools in the sample. The distributions of scores for those 20 schools dropped from the study will be found in Figures XII through XVIII in the appendix. They are called Distributions of Paired Students of Non-Selected Schools. These distributions were presented to allow the reader to examine the shapes of the distributions and to compare them with the 52 schools which remained in the study.

The medians of pre and post tests for the 52 schools which were retained in the study compared with the 20 schools dropped from the study are presented in Table XV. The pre test and post test reading medians of the 20 schools not in the study were slightly lower than the median of the 52 schools retained in the study, but the difference may not be significant. The pre test and post test medians in mathematics and in science did not differ greatly between the schools left out and the schools remaining in the study.

The purpose of this discussion has been simply to explore whether the 20 schools dropped from the study, had they been left in the study, would have significantly altered the Sierra results of the study. It is hard to believe that they would have. If the 20 schools left out would have appeared to be markedly different from the 52 schools left in, there would be reason to believe that the sample of the 52 schools was biased because of the dropping of the 20 schools from the sample. There is unquestionably some bias in the 52 schools of the Sierra, but it is likely not attributable to the dropping of the 20 schools. The sample bais originates from other factors. The most important question about the sample of the study is how representative the 52 schools are of all the Sierra schools, and how representative the 36 schools of the Coast are of all Coast schools.

The samller the sample the greater the sampling error. In a field experiment a decision has to be made concerning how many schools can be supervised carefully as well as how great an error can be allowed. A smaller number of schools can be supervised adequately, but the samller the number of schools in the sample, the greater the possibility of sampling error, even presuming the best kinds of random selection. In this study, 88 schools would not seem to be too small a sample to represent the nation's population of schools, but it is just large enough to cause difficulty in supervising field conditions if more schools were added.

Analysis of Sierra Students Who Took Pre Tests

Some students who took pre tests in the Sierra dropped out of school. Their pre test scores were compared with the scores of those who took both pre and post tests (Table XVI). The distribution of scores for students who were present only for pre tests in the Sierra are on Figures XIX to XXI.

If the pre test scores of Sierra students who dropped out of the study were markedly different from those who remained to take the post test, it might reveal a bias in the sample. The bias might be that those students who stayed in school to take the post tests were higher scorers than those who took only the pre test and later dropped out.

We see that, in reading, the drop-outs had a median two points lower than the students who remained in the study. The likelihood is not high that the drop-outs had significantly lower scores in reading, however, so if they had remained in the study they probably would not have had an influence on the sample to change the findings. The medians for mathematics and science were similar for drop-outs and those who remained in the study.

Repetition and Desertion

Repetition figures for the first grade by Province were as follows for the 1971-72 school year:

Province	Number of First Graders	Number of Students Repeating First Grade	Percentage of Repetition
Imbabura	432	83	19.2%
Pichincha	512	70	13.6%
Chimborazo	440	37	8.4%
Loja	614	181	29.4%
Guayas	491	98	16.5%
Manabi	604	139	22.8%

Repetition rates were lowest in two Sierra provinces (Chimborazo and Pichincha), and highest in another Sierra province (Loja). These figures do not show that either Coast or Sierra schools consistently had different repetition rate. A national law prohibits repetition, except in unusual circumstances. The repetition rate probably had no differential effect on types of schools, or schools assigned to various conditions. It is unlikely that rural or urban schools differed greatly in repetition rates, because

Pichincha and Guayas are the most heavily urbanized provinces; and Chimborazo and Loja are heavily rural.

The rate of desertion (which is a misnomer) is especially heavy after grade one. Of those first graders in urban schools in 1963-64, 79.6% went into the second grade the next year. In rural schools, 55.3% of the first graders of the same year went into the second grade. So rural desertion is a much greater problem than urban desertion. In 1968-69, 58.3% of those urban students who started the first grade finished the sixth grade, while in the same year, 16.8% of rural students who started the first grade finished the sixth grade.

There is a serious problem in desertion also from fourth grade to fifth grade. This is especially pronounced in rural areas, as most rural schools used to go only through grade four. The desertion figures for 1972-73 are probably not as serious as those of nearly a decade earlier.

Desertion did not affect the achievement figures as pointed out earlier. The median pre test figures for those who dropped out were little different from those who remained in the study. However, it is important to have information concerning desertion and repetition in grade to understand how these factors affect schools in Ecuador.

Teachers and The New Textbooks

The new textbooks used in the study were of reading, mathematics, and science. They were authored by an Ecuadorean team with the collaboration of the University of New Mexico technical assistance group. The books were printed in Ecuador and distributed beginning in 1970 at a small cost to the students. The textbooks were attractive in format, with Ecuadorean visual themes apparent. However even the minimal cost was enough to deter many students from buying the books.

Many teachers bought texts and then had the students pay for them over a period of time, while other teachers organized parent groups to buy the books for those who could not afford them. In spite of such efforts, many students still could not afford to buy three texts with the total cost about $1.20 U.S.

A teacher's guide was designed for reading, mathematics, and science. The reading guide for the first grade was in two volumes. The teacher guides were very detailed and thorough, presenting information on the subject as well as methods. The teachers found them somewhat difficult, especially in the content area. Many Ecuadorean teachers have not been trained at normal school level, so did not have the background necessary to use the texts.

In the field study, teachers of schools assigned to condition A, were supposed to use the teacher guides. Hence it must be remembered that teachers commenting on the guides came from only those (Condition A) schools, whereas teachers assigned to both Conditions A and B commented on the textbooks.

The Ecuadorean evaluators observed that, among teachers of Condition A schools, those who had the most extensive background of schooling used the guides most extensively and were most positive in their comments on the guides.

Some teachers mentioned that supervisors and principals discouraged them in the use of the texts. While this was encountered in only a small number of schools, it did serve to discourage those teachers who experienced negative comments. Some teachers mentioned that the principals and supervisors understood very poorly the texts and the guides very poorly, and not nearly as well as the teachers did. This is not hard to believe since so few administrators and supervisors had been oriented to the texts prior to the 1971-72 school year.

Positive comments on the three texts made by teachers included:

1. They are interesting, stimulate curiosity.
2. They unify teaching in the country.
3. Their content appears to be Ecuadorean.
4. They use psychological principles.
5. They are attractive; the graphics are expecially good.
6. They develop skills.

On specific texts they commented:

1. The reading text avoids syllabic reading.
2. The reading text encouraged comprehension.
3. The mathematics text is at once a workbook and a text for the students.
4. The student is initiated by means of the mathematics text into modern mathematics.
5. The science text make learning concepts easier.
6. The concepts in the science text are easy to understand.

The teachers made these objections to the texts, among others:

1. They are too long, too hard to handle.
2. The reading and mathematics texts especially are too long. They ought to be printed on better quality paper.
3. It is difficult to cover so much material as is in the texts especially in the unitaria and pluridocente schools.
4. The vocabulary is not correlated between the three texts.

Objections to specific texts included the following:

1. In the reading text the exercises in the fourth section are very long; the vocabulary, especially for rural schools, is very difficult.
2. The reading and science text require the use of much auxiliary material.
3. The mathematics text in some cases has confusing, abstract lessons difficult to understand.
4. Some pages in the mathematics text are too crowded with exercises.
5. The science text has abstract and difficult themes.

Teacher comments about the guides include the following:

1. They are difficult to understand.
2. They orient the teacher to the tasks.
3. They are too long.
4. They have unnecessary repetition.

General comments from texts and guides include the following:

1. The introduction of the texts requires a preparatory period for orientation of teachers.
2. Teaching materials which the texts call for should be distributed to classrooms by the ministry.
3. Purchase of the three tests by pupils imposes a hardship on some parents.
4. Often guides are difficult to obtain.
5. The results from using the texts are worth the efforts required on the part of the teacher to use them properly.

Social Substantive Schedule Observation Data

The design of the textbook evaluation included a plan to observe what kinds of teaching were being conducted in the schools. Several observation schedules exist, but the one selected was sensitive to both verbal behavior and subject matter objectives.

The Social Substantive Schedule is a means of observing teacher-pupil verbal behavior. The authors, Robert Ribble and Charles Schultz, designed twelve categories of verbal behavior which were sensitive to subject matter, so it is not a "subject-matter free" instrument. The instrument (and the directions for using it) were translated into Spanish in 1971. In February, 1972, Robert Ribble conducted a one week seminar for the members of the evaluation team. He instructed the team members in administering the instrument, categorizing verbal behaviors in classrooms, establishing inter-observer reliability, and interpreting the data. During the seminar he and the evaluation team members agreed upon needed changes in the translation, so that by March, 1972, evaluation team members were ready to administer the instrument in the schools.

The categories of verbal behavior in English and Spanish as they were agreed upon and used in this study are as follows:

Category	Spanish	English
A	Acuerdo	Agreement
B	Soporte	Support
C	Descubre	Discovery
D	Examina	Examination
E	Informe	Information
F	Neutraliza	Neutral
G	Dirige	Directing
H	Reprueba	Reproving
I	Cumple	Compliance

Category	Spanish	English
J	Voluntario	Volunteering
K	Insiste	Pursuing
L	Procede	Procedural

It is possible, of course, to argue about the appropriateness of the translation of the English terms into Spanish. No doubt scholars of both languages could arrive at more elegant and perhaps more precise translations. The process used of making this translation involved one of the authors, Professor Ribble, working with the evaluation team members in searching for the Spanish terms which carried the intent or meaning of the authors.

From now on each category will be referred to by letter rather than either English or Spanish name.

The evaluation team members administered the Social Substantive Schedule in 33 schools, in each of three subject matter areas, reading, mathematics, and science. These 33 schools were a sample of the 88 schools, since it was impossible to apply the schedule in all of the schools of the study. The 33 schools were distributed as follows:

Imbabura	9
Guayas	17
Pichincha	7
Total	33

Categories A through H are teacher verbal behaviors, while Categories I through L are student verbal behaviors. Teacher category F is neutral--not directed toward any particular objective or learning activity. Category L is neutral as well, not directed toward any specific objective. Categories F and L are not used in the analyses as they could be termed "waste-basket" categories, including random activity, confusion, noise, and personal matters.

The Social Substantive Schedule is found in the appendix to this study.

The evaluation team members went to each school with a Sony voice recorder, and made a tape recording of all of their classroom visits. So each member had a taped record as well as a written record of each classroom visit. Upon returning to their Quito offices from the field observations, the team members played the tapes and at least two, often three, members listened to each tape, categorizing each verbal behavior. The agreement between the observers ranged from .85-.95, with a median reliability of .88. The data recorded are actually a consensus arrived at between the observers as to how the verbal behaviors should be classified whenever there was less than full agreement.

The Social Substantive data were used to determine if the teacher-pupil verbal behavior correlated with:

1. Total years of teaching.
2. Years of teaching in the first grade.
3. Raw gain in each subject matter, i.e., reading, mathematics, and science.

A regression analysis was used to determine if there were significant correlations existing between the teacher-pupil verbal behaviors and now a combination of factors served as predictors for predicting a criterion of learning.

The criterion selected was subject matter gain from pre test to post test. This is called raw gain, because the gain is not manipulated statistically. Raw gain was used in the analyses of variance in the comparisons made earlier in the study.

The criterion of gain was predicted by the following factors, using each classroom as the unit of analysis, with the following factors predicting pupil gain:

1. total number of years teaching,
2. number of years teaching in the first grade,
3. Social Substantive measure 1;

   $$\frac{A + B + C + D + E}{A + B + C + D + E + G + H}$$

4. Social Substantive measure 2;

   $$\frac{A + B + C + D + E + G + H}{A + B + C + D + E + G + H + I + J + K}$$

5. Social Substantive measure 3;

   $D + K$

Social Substantive measures 1 and 2 are ratios, expressed as decimal numbers. In two cases the ratios reached 1.00. The regression analysis was computed for each subject matter. The Social Substantive data were gathered from observations in the first grade in each subject matter (reading, mathematics and science).

Social Substantive Measure 1 is a ratio of teacher support of learner behavior (A + B + C + D + E) to teacher support plus teacher dominance (A + B + C + D + E + G + H). It is a ratio of supportive behavior to a total of supportive plus dominating behavior. The higher the ratio, the more supportive behavior is being employed by the teacher. The lower this ratio, the more the pattern is one of teacher dominance. This ratio is similar to Withall's measure of social-emotional climate.

Social Substantive measure 2 is a ratio of teacher talk (A + B + C + D + E + G + H) to teacher talk plus student talk (A + B + C + D + E + G + H + I +

J + K). The higher the ratio, the higher the amount of teacher talk in the classroom. The lower this ratio, the more student talk is observed in the classroom.

Social Substantive measure 3 is a summation, or combination, of categories D and K. These two behaviors include a teacher behavior (D) which is "examination" or a type of inquiry addressed to a student once a student has volunteered, and a student behavior (K) which is "pursuing." The teacher puts a question to the group and an individual replies voluntarily. The interchange between teacher and pupil is then styled a D (teacher asking for more clarification) and K (student responding voluntarily). The combination of the two behaviors provides a measure of "examination mode," or "guided discovery." If the percentage of D and K together exceeds 20% the verbal mode of the classroom may be styled "examination mode." The verbal behavior of only three of the classrooms would have been styled close to "examination mode" according to the findings. The three classrooms were those in which the evaluators found more than one subject in which D and K together instituted close to 20% of the total behaviors. The teacher who is simply asking questions in a lecture recitation mode is classified G (teacher asking a question) followed by I (student responding). This is a different mode of question-response than D-K.

Another way to classify classroom verbal behavior according to the Social Substantive Schedule is to use the categories Traditional Modes 1, 2, and 3, and Modern Modes 1, 2, and 3, depending upon which kinds of verbal behavior predominate. The combination of behaviors referred to as lecture-recitation constitute traditional modes. The combination of behaviors referred to as examination and open exploration constitute the modern modes. In the appendix a copy of the Social Substantive Schedule and directions for its use are found. A fuller description of the modes is included in the appendix. Only one classroom was classified as Modern, and that was a class in mathematics. The evaluators said that it was marked by a great deal of student confusion which had to be classified as J, which raised the class to a Modern Mode.

The Social Substantive data were analyzed according to Urban-Rural, field experimental condition (use of texts and guides, use of texts, other texts or no texts) and type of school (A - Completa, B - Pluridocente, C - Unitaria). Analyses of variance were used to compare each of the three Social Substantive factors with school location, conditions and type.

Table XVIII shows each of the 33 schools with the characteristics and factors in this analysis. The inclusion of teacher certification was considered, but was decided against because all but four of the 33 teachers had normal school certification.

In reviewing the relationships of selected factors to the Social Substantive Schedule measures, we will first look at certain interrelationships among the factors. Table XIX shows zero order correlations between the length of service and subject matter gain factors. Total years of service for teachers of the 33 schools was deemed important, as well as number of years service of teaching in the first grade. The correlations reveal one highly significant correlation, that of science gain to mathematics gain. It indicates that the more gain a class made in mathematics, the more gain it made in science. No significant correlations were apparent between total years in service and service in the first grade, or between years of service and subject matter gain.

Relationships among the three Social Substantive Schedule measures, reading gain, and years service are shown in Table XX. The observations or measures using the Social Substantive Schedule were made in reading classes of the first grade. No relationship reached the five percent level of significance.

Relationships between Social Substantive Schedule measures, mathematics gain, and years service are shown in Table XXI. No significant correlations were found for mathematics classes.

In science classes (Table XXII) there was a significant relationship between the Social Substantive 3 measure and science gain (.359). This measure is a combination of D and K categories used by teachers. These are verbal explorations used by teachers to follow up pupil comments, like "what do you mean by that?", "Explain that, please." The Social Substantive 1 measure was correlated negatively with years service as a teacher in grade 1. This measure is a ratio which indicated the relative amount of time a teacher uses supportive verbal behaviors compared with supportive plus directive behaviors. Hence, the higher the ratio the more the supportive behaviors are used. The negative correlation (-.363) indicated that the lower the ratio the longer a teacher has served in the first grade. This would not be expected because one would associate longer experience in the first grade with more supportive verbal behaviors.

A third significant correlation (.581) was a positive relationship between the Social Substantive 2 measure with the Social Substantive 1 measure. The higher the ratio of supportive behavior used by the teacher, the higher the ratio of teacher talk to total talk observed in the classroom. The Social Substantive 2 measure is the ratio of teacher verbal behavior to total verbal behavior observed in the classroom. It must be borne in mind that the relationships used are specific to the subject matter, in this case, science, and not generalizable to other subject matter.

It is interesting that there was so few significant relationships bewteen the Social Substantive measures and other variables in reading and mathematics. Perhaps teachers in science classes feel freer to be more unstructured and more flexible than in reading or mathematics classes. But longer service in the first grade does not evoke such flexibility, indeed the opposite is the case.

We will next examine the intercorrelations among Social Substantive measures across subject matter areas. We can get an idea from these whether teachers were consistent in their verbal behavior from one subject matter to another. Table XXIII shows that there were significant relationships between Social Substantive 1 measures in math and reading classes (.443) and between science and reading classes (.351).

Using the ratio of teacher verbal behavior to total classroom verbal behavior, called Social Substantive measure 2, elicited significant relationships between mathematics and reading classes (.470), and science and mathematics classes (.429). These relationships are found in Table XXIV.

The amount of examination behavior between teacher and pupils, Social Substantive measure 3, was highly related between mathematics and reading classes (.501), science and reading classes (.779), and science and mathematics classes (.634). These relationships, presented in Table XXV, were the highest and most consistent relationships of the three Social Substantive measures.

In summarizing the intercorrelations between classes, using all three Social Substantive measures, it is evident that teachers were consistent in their verbal behavior from one class to another. Teachers tended to be especially consistent in their use of examination behavior with students. These findings do not indicate that teachers used a great deal of verbal examination behavior, or any other kind of verbal behavior, but indicate that they were consistent in using little or a great deal of such behavior from one class to another.

In Table XXVI the multiple correlations are presented. These multiple correlations are indices of relationships of five predictors (total number of years in teaching, number of years teaching in the first grade, and Social Substantive measures 1, 2, and 3) of gain in each subject. The multiple correlations are not impressive for any subject matter. The percentage of variance of the gain in reading accounted for by the five predictors was only 10%. The five predictors accounted for only 16% of the variance in mathematics gain. The variance in science gain accounted for by the five predictors was 20%, the highest of the three, but still not substantial.

By examining the zero-order correlations in Tables XX, XXI, and XXII, one can see where the contributions to the multiple R, or the percentage in variance in subject matter, came from. Science gain had the highest relationship with the Social Substantive measure 3 of .359. That was the highest relationship between any gain and any predictor. Mathematics gain had a correlation of -.300 with Social Substantive measure 2, which was the second highest relationship. These two relationships are responsible for the predictors explaining more variance in science and mathematics gain than in reading gain. Experience had little relationship to subject matter gain.

In explaining the percentage of variance accounted for by the predictor variables, we are simply attempting to find out why some classes have more gain than others in the three subjects. We weren't very successful in explaining why certain classes gain more than others for several reasons:

1. Years of experience didn't explain much, or weren't related to a high degree with gain. We thought there would be a higher correlation, or contribution to differences in gain.
2. The three Social Substantive measures weren't related very high with differences in gain, either, but they were somewhat better than experience in accounting for differences. In science, the Social Substantive 3 measure was the most helpful in explaining differences in gain. Why? Perhaps because in Science, teachers feel more free to experiment with pupils' talking and explaining. Teachers may feel that they must be more rigid in following a method in reading and mathematics, but can experiment a little more, be more open in trying different ideas, in science. They have been trained in reading and mathematics methods, but not in science methods, hence the normal school graduate is thrown on his own resources in science teaching. He must try something, and so apparently relaxes the climate a little in science.
3. The greatest explanation of differences between classes in gain come from variables not controlled for or investigated in this study, such as socio-economic level. The Coleman Report of 1966 showed that in U.S. schools, socio-economic factors are for more important predictors of achievement than anything else. A study now in progress, The Educational Quality Assessment, conducted by the Pennsylvania Department of Education, is already demonstrating an overpowering relationship between socio-economic variables as predictors of differences in achievement among schools.*

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*According to verbal statement by Richard Kohr, of the Pennsylvania Department of Education, May 19, 1973.

Other variables might account for achievement differences, such as intelligence of the child, encouragement by the family to do well in school, help from others in the family, desire to do well in school, amount of food, and health of the child to name but a few. These were not controlled for or investigated. It is a fact observed by all in the evaluation team, that malnourishment is a great problem and one which teachers definitely think is related to achievement in school.

4. Variables which were controlled for in the Study and which did not account for differences in achievement gain, and which are not included in these five, are type of certification, organization of the school as to male, female, and mixed, or location in the Coast or Sierra.
5. We will look further at the influence of factors such as urban-rural location, type of school (Completa, Pluridocente, or Unitaria), and whether or not textbooks were used to see if they influenced school achievement, or were related to the achievement gain differences in the 33 schools, and to the Social Substantive measures. We already know that for the 88 schools there were not significant differences by urban and rural location or textbook usage, and that the Completa schools tended in some cases to have higher achievement.

The partial correlations are presented in Table XXVII. They are correlations of each independent variable to a dependent variable with effects of other independent variables partialled out. They are not semi partial correlations and cannot be squared and summed to obtain the total explained variance.

The regression program was modified to allow each variable to be forced into the regression. Without this modification, the variable which did not contribute significantly to the total variance of the criterion variable (raw gain) would have been rejected. Consequently partial correlations for all variables would not have been obtained, because some variables contributed so little to the variance. The total variance of reading gain explained by the five variables was so small that little information would have been generated by the program unless all five variables had been forced in.

The data have been analyzed by means of a linear correlation program. In one set of data, the analysis of reading gains by types of schools, it appeared that the data may be non-linear. The many non-significant correlations are indices of low linear correlations. Much of the data may be non-linear. The use of a non-linear correlation program might have elicited higher correlations with the same data.

The partial correlations reflect the relative size of the various zero-order correlations from Tables XX to XXII. The largest partial correlation (.401) is between Social Substantive measure 3 and science gain. The next highest partial correlation was between Social Substantive measure 2 and mathematics gain. It was a negative correlation (-.327).

Analyses of Variance of Social Substantive Schedule and Other Variables

One way analyses of variance were used to make all the following comparisons:

Urban-Rural

The 33 schools in this subsample were divided into eight urban and 25 rural schools. Comparisons between urban and rural schools were made on teachers' total years in teaching, and teachers' number of years in the first grade. There were no differences between urban and rural teachers on those variables.

Comparisons were made on reading, mathematics and science gain between the 8 urban and the 25 rural schools. There was a significant difference between the two groups of schools on reading gain, but not on mathematics or science gain. The urban schools had a significantly higher achievement gain in reading than rural schools (20.16 urban vs. 14.54 rural, F = 5.89, with 1 x 31 Df, significant at the .01 level).

Using the three Social Substantive measures on each subject matter, there were no significant differences between urban and rural schools.

Types of Schools

The 33 schools in the subsample were divided into eleven completa, twelve pluridocente, and ten unitaria schools. Comparisons between the three types of schools were made concerning total number of years in teaching, and number of years teaching in the first grade. No differences were evident among the three types of schools.

Comparisons between the three types of schools were made with respect to gains in reading, mathematics, and science. In reading, the completa schools had significantly higher gains than either the pluridocente or unitaria schools (Completa = 20.56, Pluridocente = 13.58, Unitaria = 13.57; F = 6.374, with 2 and 30 Df, significant at the .01 level).

The three types of schools were compared on the three social substantive measures in three subjects; for a total of nine comparisons. The only comparison which yielded significant differences was on the Social Substantive 2 measure in reading. In that comparison, the unitaria schools had a higher ratio than the pluridocente or completa schools (F = 4.772, with 2 and 30 Df, significant at the .01 level). The ratios were .66 for unitaria, .57 for pluridocente, and .57 for completa schools. The higher the ratio, the higher the proportion of teacher talk to total verbal behavior observed in the classroom. Hence, one room school teachers are more dominating than teachers in other types of schools in teaching reading.

Textbook Usage

Comparisons were made, using one way analyses of variance, of schools using texts and guides, schools using texts, and schools using other or no texts, with the total number of years experience in the school. No differences among schools by textbook use was found on that variable, nor was any difference found on the number of years' experience in the first grade among teachers of schools assigned to the various textbook usage. Hence, teachers of schools assigned to three different field conditions did not vary in total teaching experience or experience in the first grade.

Textbook usage was not related to gain in reading, mathematics, or science in the 33 schools.

Textbook usage was not related to the three social substantive measures in reading, mathematics or science in the 33 schools.

Among all types of comparisons fewest differences among schools were found using the classification of kind of textbook usage. It did not matter whether the 33 schools used textbooks in analyzing experience, subject matter gain, or the social substantive measures.

In summing up the comparisons of urban-rural, school type, and textbook usage with experience, subject gain, and social substantive measures, few differences were found. There were slightly more differences according to type of school than according to urban-rural location or textbook usage.

SUMMARY AND CONCLUSIONS OF THE STUDY

In 1971 and 1972, a group of Ecuadorean evaluators planned and carried out an evaluation of the new textbooks of reading, mathematics and science in 88 schools, 36 on the Coast and 52 in the Sierra, in a total of six provinces.

A field experiment was designed in which each school was assigned to a condition. Condition "A" was defined as obligatory use of all these textbooks and guides. Condition "B" was defined as use of these textbooks to whatever extent deemed appropriate by the teacher. Condition "C" was defined as the use of other textbooks, or no textbooks.

The design included a pre and post test about seven months apart to be given in each school in reading, mathematics, and science. The Ecuadorean Ministry of Education evaluation team designed tests for each subject matter in two forms. In a sample of 32 schools the Social Substantive Schedule was used to determine type of teaching style and its relationship to achievement in each subject. The teachers were also asked how far they progressed in the textbooks, and their opinions of the textbooks and guides.

Comparisons of schools according to Urban-Rural, and grading type (Unitaria, Pluridocente, Completa) were made, as well as according to field condition (A, B, C). An analysis of variance (Lindquist, Type I) was made of each type of comparison by pre and post test scores.

Originally twenty additional schools had been chosen for the Sierra sample, but due to the lack of cooperation by supervisors to guard the conditions of the field experiment, the twenty schools had to be dropped, leaving a total of 52 in the Sierra, or 88 for the Coast and Sierra.

The evaluation team members administered all pre and post tests, questionnaires, and the Social Substantive Schedule. Data were assembled in Ecuador and statistical analyses were made on computers in Ecuador. The consultant from The Pennsylvania State University advised the evaluation team in the design construction of tests, and execution of the design and use of instruments. He analyzed the data once it had been processed. He assisted in planning the final report and consulted with the evaluation team in analyzing their data.

The data support the following conclusions for the 88 first grade schools of six provinces of the Sierra and Coast which were sampled in the 1971-72 school year:

1. There were no significant differences in achievement means or gains for reading, mathematics or science, among schools assigned to three field conditions. Those three conditions were schools in which texts and guides had to be used, schools in which texts were used without guides, and schools in which other or no texts were used. When it has been stated that those schools using the textbooks had no better achievement than those which didn't use the texts, this does not mean that the texts are a waste of time and of money. It does mean that the texts were not being used to the best advantage. This is not surprising, when one takes into account the difficulty of introducing on a widespread scale any kind of new materials. The introduction of new science programs in the junior and senior high schools and new mathematics programs in the elementary schools of the U.S. in the early 1960's provoked resentment and confusion where the teachers were not ready for the programs, and where the parents had not been introduced to the purposes of the programs.

The tests used to measure achievement were built from content of the new texts and the national curriculum guide of the Ministry of Education, so the criterion used did not appear to be inappropriate.

1a. The retraining program of the first and second grade teachers is now underway. It is to be expected that the effectiveness of the use of the new textbooks will rise as teachers become oriented to the philosophy and practical aspects of the new program. This expectation must be accompanied with the caution that if the directors of the schools and the supervisors do not encourage the teachers in the use of the new texts that they will not be used as effectively as anticipated. Teachers in Ecuador, not surprisingly, are very attentive to cues given by authorities. This is not surprising because directors and supervisors have control over their promotions, salary increases, transfers, and ratings. If a director, or especially a supervisor, makes a slighting remark about the new texts it can be expected that only a very rare teacher would show enthusiasm for the new texts and their methodology despite his inner conviction that the new textbooks are good and despite that teacher's enthusiastic participation in the retraining program. If the majority of directors and supervisors are not oriented to and trained in the new textbook program philosophy and methodology, it can be assumed that the best retraining efforts for teachers will be frustrated, and the new textbooks will be no more effective than the old textbooks. Middle management (translated into Ministry of Education terms that is the school directors and supervisors) can collectively defeat any innovation. The research on bureaucracy abounds with examples of that premise. It will take a powerful training program for the middle managers, as well as powerful direction from upper management levels of the Ministry to assure the cooperation of the middle management personnel. It will also require the formulation of policy by the Ministry to ensure the cooperation of all professionals with this, or any other system change as far-reaching as a textbook program.

2. There were no significant differences in achievement in reading, mathematics, or science between urban and rural schools.
3. There were differences in 4 out of 9 comparisons between types of school: graded (completa), pluridocente (more than one grade per teacher) and unitaria (one room, one teacher) schools. The differences in reading and science were in favor of the completa schools where there was one teacher per grade. Most, but not all, of the graded schools were urban, but the grading organization was more important in accounting for differences in achievement than location.
4. The schools in which the study was conducted were a sample. If the sample of 88 schools had been larger, perhaps more differences might have emerged.
5. First grade students have been measured with pre and post tests shortly after the beginning and before the end of the school year. That practice provides extremely valuable data for planning. However, the practice of measuring first grade achievement is not in high favor among many educators who specialize in the education of early primary children. In the schools in which the team administered

the tests, fatigue did not appear to set in to cause children to cease taking the test. The testing periods for the students were spaced so that resting periods of at least an hour between each test were maintained. The classrooms in which the tests were given were much more structured and highly disciplined than those in U.S. schools. The testing conditions were far more arduous than in U.S. first grade classrooms. Therefore, no comparisons should be made between tests conditions in U.S. classrooms and hypothesized gains in U.S. first grade classrooms, and conditions and gains in Ecuadorean classrooms. The two situations, including expectations for children, are radically different. Reliability should not be judged on any other than Ecuadorean standards. From all evidence available, the tests are reliable.

6. A base of data now exists for studying achievement in first grade classrooms of Ecuador. Whether that base is low or high can only be judged by further study of the achievement of first grade Ecuadorean children.

7. Comparisons should not be made between achievement in one subject matter and another because the items represent different skills and are samplings of different types of knowledge. Hence, it is not valid to conclude that the reading texts were more affective than the science or mathematics texts because first graders gained more items in one year in reading than in the other two subjects. The difficulty levels of the reading, arithmetic, and science items are very likely different for the 12th item in each test, or for the 24th item in each test.

8. Few students reached the "top" or got 50 items correct on any test. These tests could be used at the beginning of the second grade to see if students gained or lost during the vacation period, for example. They could be used later in the second grade to measure achievement if the first grade textbooks are used in that grade.
9. The teachers sampled used a little more than the first ½ of the reading textbook in the first grade. This means the first grade readers could easily be used in the first part of the second grade, perhaps even longer. This presumes the books are well enough bound to hold together that long.
10. The teachers in the sample used a little more than the first half of the arithematic text. This would allow the same book to be used well into the second grade, presuming it is durable enough, of course.
11. The teachers in the sample used about the first half of the natural science textbook. They did not select from it, but used the lessons in sequence. This practice would easily allow the use of the textbook in the second grade for most of the year, again presuming the book has been bound well enough.
12. Although the schools of Field Condition A were supposed to use the texts and guides, it was apparent that the teacher guides were not used extensively. Teachers complained about the difficulty of the guides. It did not require teacher statements to make that finding, however. It was evident that in very few classrooms of the Condition A schools, teachers were putting into practice the advice of the guides. While the guides are excellent in every

respect, they are apparently too difficult for many teachers, especially those trained with less than a normal school background, to comprehend. Education, at least to the full normal school level, is necessary to understand the guides. The better the teacher's education, the more a teacher was likely to understand and use the guides in Condition "A" schools. Teachers in Condition "B" and Condition "C" schools were not supposed to use the guides. It appeared, however, that the obligatory use of the guides was not sufficient to bring about higher achievement in schools where they were used the first year than in schools were they weren't used.

13. Some teachers mentioned that supervisors did not understand the texts and guides. A few teachers mentioned that supervisors counseled them against the teacher use of ideas that the supervisors perceived the guides advocated. The conflict between what teachers and supervisors felt the guides were adovcating and the training the better teachers had received actually was nonexistent, particularly with regard to methods of reading instruction. It was perceived that, for example, the guides for reading advocate only the whole word approach, whereas in fact the guide urges teachers to be pragmatic on that point. The guides suggest resources but do not dictate a particular methodology. As the retraining of teachers proceeds, it is likely that the teachers will be far better informed on the guides and texts than the directors and supervisors. If that is not remedied, severe and continuing damage to the textbook program will result. Only three of the 29 supervisors involved in the study hold certification as supervisors.

14. Gains in each subject, for every comparison in the study, for Sierra and Coast were highly significant from pre test to post test. This is to be expected, but should not be overlooked. It would have been possible for gains not to have reached significant levels, particularly in science, where less teaching was attempted. The gains were not as spectacular in the areas of science and mathematics as in reading. This is to be expected because the one tool which children must master most quickly and surely is reading. Teachers may have put most emphasis upon it, leaving development of other skills until perhaps the second or third years. But reading was not attended to at the expense of gain in the other two areas. It is possible to expect gains in the first grade, based on what we now know, in the three subjects of reading, mathematics and science. How much relative emphasis should be put upon these three different subjects is a curriculum policy and planning item for the Ministry of Education. In terms of use of the text, the teachers appear to use more of the reading and mathematics texts than of the science text.

15. Major positive comments of the teachers on the texts in general were that:
    a. They are interesting.
    b. They help teaching and learning.
    c. The content of the texts is greater than the official national curriculum for the first grade.
    d. They unify teaching throughout the country.
    e. They use psychological principles.

Major criticisms of the three texts in general were that:

a. They are too long, too difficult to use in their entirety, especially the Reading and Mathematics texts.

b. They should have been made with better quality paper.

c. For Pluridocente and Unitaria schools, especially, they contain too much difficult content for grade one.

d. The vocabulary of the three texts is not correlated.

16. The repetition rate differed from one province to another. Little relationship between repetition and students achievement was noted. No statistical tests of significance were made between Sierra and Coast children or between provinces.

17. Urban drop out rates were higher than rural drop out rates, but this fact did not appear to effect the achievement results of urban and rural schools. Students who dropped out did not appear to affect the results appreciably. The necessity of having to drop 20 schools from the Sierra sample did not appear to affect the results greatly.

18. Many students in Condition A and B schools could not afford the textbooks. Many students in fact were badly malnourished in the Sierra and Coast schools, so apparently they came from very poor families.

19. The Social Substantive Schedule was used to determine the style of teaching in the classrooms. The teachers used largely a direct presentation style of lecture, questions to individual students, and answers from individual students which was a traditional mode. Only the three traditional types of teaching

were encountered. With one exception (science and SSM) Social Substantive measures were unrelated to student achievement gain, experience of teachers related to student gain. Use of the Social Substantive measures was consistent within subject matter.

20. The fact that methodology of the study had to be changed because of lack of cooperation shown by certain supervisors reveals the great autonomy which supervisors possess. In spite of highly centralized educational policy and, seemingly, of control, the supervisors have a great deal of freedom to interpret policy and directives from high levels of the Ministry in any way they choose. They may plead lack of time, resources, or proper direction for a given project, but they do have the freedom to comply or not, as they choose, with an order. This fact has great implications for research, evaluation, and training policies in the Ministry of Education. Supervisors when not convinced of the rightness or value of a directive or policy can frustrate that directive or policy by a number of stratagems. These strategems are not peculiar to supervisors in Ecuador, but are encountered in any bureaucracy anywhere in the world. Nor is the phenomenon of resistance to change peculiar to supervisors in Ecuador. In every bureaucracy there is resistance to change, and in educational institutions, resistance is often found at middle levels--principals and supervisors. In this matter, Ecuador is typical, not peculiar. What is most important is to locate resistance to change and where that resistance is most powerful It was located at the supervisory level in this study.

Teachers would comply with a research plan providing principals, but especially supervisors, encouraged them or permitted them. Principals in some cases were resistive to the study but usually were so when the supervisors were. Upper levels in the Ministry appeared to be more research oriented than lower levels in the Ministry.

RECOMMENDATIONS FOR THE MINISTRY OF EDUCATION

The textbooks are soon to be revised. Fifth grade texts are now being written. Before completing this series for all six primary grades, and before revision is begun, certain alternatives should be considered among which are:

1. The use of first grade texts should be considered for grades one and two. Since few students will have completed the first grade texts before going into grade two, they should be used in grade two for those students who have not yet mastered or finished the content. This would fit into the objective of the textbook program of having each teacher work with at least two groups in each grade. In each second grade classroom, one group could use the first grade text, and another group the second grade text. National educational policy does not encourage the teacher to retain most children simply to finish the first grade textbook.
2. The texts and guides of reading in grades one through six should be seen ultimately as a continuous program, not as isolated materials appropriate only for one grade. The same is true of the science and mathematics materials. Each subject matter textbook series with

its guides constitute a program which might be used in many grade levels depending upon the characteristics and speed of learning of students in that grade. It may be advantageous in grade four, for example, to use the texts for grades one, two, three, and four, for different students. This accords also with national policy which prohibits retention except for grave reasons (and which appears now to be largely disregarded).

3. If texts are to be used longer than one year, and used in different grade levels, they may have to be strengthened appreciably.
4. Science texts could easily be used at many different grade levels because the content of these texts supposedly does not have to be used sequentially.
5. Another alternative is to publish the content of the first grade texts (and perhaps other texts) in modules (Fasciculos). This would allow greater flexibility in the use of the contents. The contents could be arranged in four to eight modules for the first grade reading and mathematics books. This would allow their use easily in grades two and three, for example, for those students who have not progressed so rapidly. The same principle could be applied to texts designed for other grades. Flexibility in the use of the textbooks needs to be considered, and modules allow for great flexibility. With the module idea, the textbooks need not be conserved, but the module would be smaller, hence more expendable. The cost for students might be more reasonable too, providing students are still charged for the texts.
6. Textbooks in whatever form should be furnished free, especially to students from poor families. Many students who do not have enough

to eat cannot afford to buy three textbooks.

7. Teachers should devise methods, with the help of the Ministry, of keeping account of how far their students go in the textbooks, so that other teachers will know how far the students have progressed. Without some kind of system, many students will be either forced to repeat material which is too easy, or will be forced into material for which they are not yet ready. With a module system, instead of textbooks, a system of pupil progress accounting could be built into the system.

8. The textbooks, in whatever form they are ultimately revised, should be field tested in 25-50 schools before being sent to the presses. At this time, it appears that teachers are not influencing the construction of textbooks or guides. The teachers of these classrooms should be consulted about the effects of the material, arranged in units, on children with respect to

   a. difficulty of material
   b. format
   c. vocabulary difficulty
   d. sequence of ideas
   e. comprehension of concepts
   f. relevance to students' interests

   These should be regular system of feedback from a pilot group of schools in which the material is tested to the textbook writers. The schools should represent various socio-economic conditions. The information from teachers in there schools concerning effectiveness of the texts is essential in creating relevant, interesting graded materials. There might also be established a committee of teachers and normal school primary education experts to advise the textbook writers on the content, arrangement, and organization of the program materials and guides. The writing of a national textbook program is too important and scientifically complex a task to be a matter for only a few writers.

9. The Ministry's data base needs to be improved. There are no current figures on the number of schools, their enrollment, and identifying characteristics. When a study is undertaken now, the researchers must actually go to the field to determine whether a given school is in existence and what kind of school it is.

10. The tests of the three subjects are now ready to be used to ascertain whether retraining of first grade teachers resulted in larger gains and more intensive use of texts and guides. The tests should also be used to determine whether the data gathered in this study represent achievement of first grade children for the entire country. A valuable tool exists which should be used by the Ministry to secure data on first grade achievement at least every two years, to determine if the textbooks are having an impact, and whether children's learning is increasing due to a variety of influences, over a given amount of time.

11. An excellent and proven design exists for studying first grade achievement related to certain school and teacher factors. This design should be used again. Elements of research and evaluation processes now available to the Ministry for more complex studies include:

a. knowledgeable personnel

b. computer programs developed especially for Ecuadorean facilities, for the Ministry of Education

c. a design for evaluation

d. testing materials in reading, mathematics, and science, with 2 forms for each test (for Coast and Sierra)

e. the Social Substantive Schedule translated into Spanish, with skilled people ready to use it

f. questionnaires concerning teacher and student use of textbook and guides

g. the experience of schools, supervisors, and an evaluation team in using a nationwide evaluation design

12. Directors and supervisors should be trained, not only in the textbook programs, but in their roles as administrators and resource people in a professional system in a country which is rapidly changing. The demands for leadership upon the Ministry of Education will become immense as manpower needs become more complex.

13. Non-school use of the textbook program should be considered. It may not be possible to put all children of school age into classrooms for many years. Hence, the textbook programs, in whatever form they are prepared, may be used extensively outside the schools for literacy training, for education of families, for community education, for education of adults, and many other non-school purposes. Experimentation with the textbook programs, especially of first grade materials, should be started as soon as possible.

REFERENCES

John E. Searles, Regional Textbook Program Survey Reports, Volumen IV, Summary of the Project. Organizacion De Estados Centroamericanos y Panama and Regional Office for Central America and Panama of the United States Agency for International Development, March, 1971.

James S. Coleman, et. al., Equality of Educational Opportunity, 2 vols. Washington, D. C.: Office of Education, U.S. Department of Health, Education and Welfare, U.S. Government Printing Office, OE-38001; Superintendent of Documents Catalog No. FS 5. 238:38001.

Frederick Mosteller and Moynihan, Daniel P. (eds.), On Equality of Educational Opportunity. N.Y., Random House, 1972.

Paul G. Whitmore, Melching, William H., and Frederickson, Edward W. Gain in Student Achievement As A Function of Inservice Teacher Training in Classroom Management Techniques, HumRRO Technical Report 72-26, HumRRO Division No. 5, Fort Bliss Texas, Human Resources Research Organization, October, 1972.

TABLE IA

Reading Pre and Post Test Means for Urban and Rural Schools of the Sierra

Location of School	Pre Test Means	Post Test Means	Total Mean (Pre & Post)	Number of Schools
Urban	11.782	34.298	23.040 (3.939)	14
Rural	11.779	29.702	20.741 (3.548)	38
Urban and Rural	11.78	30.94		52

(Standard Deviations in Parentheses)

TABLE IB

Reading Pre and Post Test Means
for Urban and Rural Schools of the Coast

Location of School	Pre Test Means	Post Test Means	Total Mean (Pre & Post)	Number of Schools
Urban	16.502	28.890	22.696 (3.860)	10
Rural	18.246	27.136	22.691 (4.599)	26
Urban and Rural	17.762	27.623		36

(Standard Deviations in Parentheses)

TABLE IC

Reading Pre and Post Test Means
for Urban and Rural Schools of Coast and Sierra

Location of School	Pre Test Means	Post Test Means	Total Mean (Pre & Post)	Number of Schools
Urban	13.749	32.045	22.897 (3.910)	24
Rural	14.407	28.660	21.533 (4.121)	64
Urban and Rural	14.227	29.583		88

(Standard Deviations in Parentheses)

TABLE IIA

Mathematics Pre and Post Test Means for Urban and Rural Schools of the Sierra

Location of School	Pre Test Means	Post Test Means	Total Mean (Pre & Post)	Number of Schools
Urban	4.151	15.946	10.048 (1.252)	14
Rural	3.930	14.911	9.420 (1.269)	38
Urban and Rural	3.990	15.189		52

(Standard Deviations in Parentheses)

TABLE IIB

Mathematics Pre and Post Test Means for Urban and Rural Schools of the Coast

Location of School	Pre Test Means	Post Test Means	Total Mean (Pre & Post)	Number of Schools
Urban	13.044	25.055	19.050 (1.298)	10
Rural	12.812	28.176	20.494 (2.904)	26
Urban and Rural	12.876	27.309		36

(Standard Deviations in Parentheses)

TABLE IIC

Mathematics Pre and Post Test Means for Urban and Rural Schools of the Coast and Sierra

Location of School	Pre Test Means	Post Test Means	Total Mean (Pre & Post)	Number of Schools
Urban	7.857	19.742	13.799 (4.616)	24
Rural	7.538	20.300	13.919 (5.827)	64
Urban and Rural	7.625	20.148		88

(Standard Deviations in Parentheses)

TABLE IIIA

Science Pre and Post Test Means for Urban and Rural Schools of the Sierra

Location of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Urban	8.214	16.605	12.409 (1.384)	14
Rural	7.798	15.783	11.791 (.892)	37
Urban and Rural	7.912	16.009		51

(Standard Deviations in Parentheses)

TABLE IIIB

Science Pre and Post Test Means for Urban and Rural Schools of the Coast

Location of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Urban	16.693	27.974	22.334 (1.394)	10
Rural	16.109	28.581	22.345 (3.116)	26
Urban and Rural	16.271	28.413		36

(Standard Deviations in Parentheses)

TABLE IIIC

Science Pre and Post Test Means for Urban and Rural Schools of the Coast and Sierra

Location of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Urban	11.747	21.342	16.545 (5.086)	24
Rural	11.053	20.736	15.894 (5.915)	63
Urban and Rural	11.242	20.901		87

(Standard Deviations in Parentheses)

TABLE IVA

Reading Pre and Post Test Means For Sierra Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	12.602	31.503	22.052 (3.504)	19
Condition B	11.334	32.075	21.705 (2.942)	15
Condition C	11.284	29.399	20.341 (4.453)	18
Conditions A, B, C	11.780	30.940		52

(Standard Deviations in Parentheses)

TABLE IVB

Reading Pre and Post Test Means for Coast Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	19.219	28.255	23.737 (2.727)	12
Condition B	15.304	24.382	19.843 (5.230)	12
Condition C	18.763	30.232	24.497 (3.315)	12
Conditions A, B, C	17.762	27.623		36

(Standard Deviations in Parentheses)

TABLE IVC

Reading Pre and Post Test Means for Coast and Sierra Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	15.164	30.246	22.705 (3.328)	31
Condition B	13.098	28.656	20.877 (4.222)	27
Condition C	14.275	29.732	22.004 (4.521)	30
Conditions A, B, C	14.227	29.583		88

(Standard Deviations in Parentheses)

TABLE VA

Mathematics Pre and Post Test Means for Sierra Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	3.855	15.434	9.644 (1.205)	19
Condition B	4.215	15.881	10.048 (.953)	15
Condition C	3.943	14.355	9.149 (1.478)	18
Conditions A, B, C	3.990	15.189		52

(Standard Deviations in Parentheses)

TABLE VB

Mathematics Pre and Post Test Means for Coast Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	12.869	27.406	20.137 (2.109)	12
Condition B	12.426	26.524	19.475 (2.576)	12
Condition C	13.334	27.999	20.667 (3.022)	12
Conditions A, B, C	12.876	27.309		36

(Standard Deviations in Parentheses)

TABLE VC

Mathematics Pre and Post Test Means for Coast and Sierra Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	7.344	20.068	13.706 (5.360)	31
Condition B	7.865	20.611	14.238 (5.039)	27
Condition C	7.700	19.812	13.756 (6.066)	30
Conditions A, B, C	7.625	20.148		88

(Standard Deviations in Parentheses)

TABLE VIA

Science Pre and Post Test Means for Sierra Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	7.914	16.115	12.014 (.993)	19
Condition B	8.173	16.242	12.208 (.832)	15
Condition C	7.681	15.684	11.682 (1.300)	17
Conditions A, B, C	7.912	16.009		51

(Standard Deviations in Parentheses)

TABLE VIB

Science Pre and Post Test Means for Coast Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	16.478	28.969	22.723 (2.014)	12
Condition B	15.039	27.316	21.178 (3.149)	12
Condition C	17.297	28.953	23.125 (2.562)	12
Conditions A, B, C	16.271	28.413		36

(Standard Deviations in Parentheses)

TABLE VIC

Science Pre and Post Test Means for Coast Schools in Three Field Conditions

Type of Condition	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Condition A	11.229	21.090	16.160 (5.420)	31
Condition B	11.225	21.164	16.194 (4.965)	27
Condition C	11.271	20.469	15.870 (6.555)	29
Conditions A, B, C	11.242	20.901		87

(Standard Deviations in Parentheses)

TABLE VIIA

Reading Pre and Post Test Means for Three Types of Schools in Sierra

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	11.738	34.649	23.193 (3.552)	20
Pluridocente	11.714	28.337	20.025 (3.828)	15
Unitaria	11.888	28.872	20.380 (3.136)	17
Three Types	11.78	30.94		52

(Standard Deviations in Parentheses)

TABLE VIIB

Reading Pre and Post Test Means
for Three Types of Schools on Coast

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	17.094	29.470	23.282 (2.042)	12
Pluridocente	15.293	25.260	20.277 (4.551)	12
Unitaria	20.899	28.139	24.519 (4.883)	12
Three Types	17.762	27.623		36

(Standard Deviations in Parentheses)

TABLE VIIC

Reading Pre and Post Test Means for Three Types of Schools of Coast and Sierra

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	13.747	32.707	23.227 (3.074)	32
Pluridocente	13.305	26.969	20.137 (4.167)	27
Unitaria	15.616	28.569	22.093 (4.448)	29
Three Types	14.227	29.583		88

(Standard Deviations in Parentheses)

TABLE VIIIA

Mathematics Pre and Post Test Means for Three Types of Schools in Sierra

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	4.171	16.094	10.132 (1.218)	20
Pluridocente	4.037	14.641	9.339 (1.085)	15
Unitaria	3.734	14.609	9.172 (1.330)	17
Three Types	3.990	15.189		52

(Standard Deviations in Parentheses)

TABLE VIIIB

Mathematics Pre and Post Test Means for Three Types of Schools on Coast

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	12.995	27.355	20.175 (1.704)	12
Pluridocente	11.497	25.494	18.496 (2.321)	12
Unitaria	14.137	29.079	21.608 (2.790)	12
Three Types	12.876	27.309		36

(Standard Deviations in Parentheses)

TABLE VIIIC

Mathematics Pre and Post Test Means for Three Types of Schools of Coast and Sierra

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	7.480	20.317	13.899 (5.065)	32
Pluridocente	7.353	19.465	13.409 (4.873)	27
Unitaria	8.039	20.596	14.318 (6.463)	29
Three Types	7.625	20.148		88

(Standard Deviations in Parentheses)

TABLE IXA

Science Pre and Post Test Means for Three Types of Schools in Sierra

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	8.241	16.682	12.461 (1.214)	20
Pluridocente	8.194	15.609	11.901 (.781)	14
Unitaria	7.294	15.546	11.420 (.844)	17
Three Types	7.912	16.009		51

(Standard Deviations in Parentheses)

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TABLE IXB

Science Pre and Post Test Means for Three Types of Schools on Coast

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	16.164	27.688	21.926 (1.573)	12
Pluridocente	15.533	28.011	21.772 (3.347)	12
Unitaria	17.117	29.539	23.328 (2.739)	12
Three Types	16.271	28.413		36

(Standard Deviations in Parentheses)

TABLE IXC

Science Pre and Post Test Means in Three Types of Schools of Coast and Sierra

Type of School	Pre Test Mean	Post Test Mean	Total Mean (Pre & Post)	Number of Schools
Completa	11.212	20.809	16.011 (4.779)	32
Pluridocente	11.897	21.325	16.611 (5.406)	26
Unitaria	10.665	20.608	15.637 (6.782)	29
Three Types	11.242	20.901		87

(Standard Deviations in Parentheses)

TABLE XA

Reading Pre and Post Test Means
for Type of Schools (U, Pl, Com.)
and According to Field Conditions (A, B, C)

Combined Pre and Post Test Means of Schools by Type

Type of School	Pre and Post Mean	Number of Schools
Completa	24.519	12
Pluridocente	21.142	12
Unitaria	22.417	12

Combined Pre and Post Test Means of Schools by Field Condition

Field Condition	Pre and Post Mean	Number of Schools
A (New Texts and Guides)	23.737	12
B (New Texts)	19.843	12
C (Other texts)	24.497	12

All Pre and Post Test Means

Pre Test Mean	Post Test Mean	Number of Schools
17.762	27.623	36

Pre and Post Test Means of Schools Assigned to Field Conditions

Field Condition	Pre Test Mean	Post Test Mean	Number of Schools
A	19.219	28.255	12
B	15.304	24.382	12
C	18.763	30.232	12

TABLE XA (Continued)

Pre and Post Test Means of Schools by Type

Type of School	Pre Test Mean	Post Test Mean	Number of Schools
Completa	20.899	28.139	12
Pluridocente	15.382	26.901	12
Unitaria	17.005	27.829	12

TABLE XB

Mathematics Pre and Post Test Means
For Types of Schools (U, Pl, Com.)
and According to Field Conditions (A, B, C)

Combined Pre and Post Test Means of Schools by Type

Type of School	Pre and Post Mean	Number of Schools
Completa	21.608	12
Pluridocente	19.079	12
Unitaria	19.592	12

Combined Pre and Post Test Means of Schools by Field Conditions

Field Conditions	Pre and Post Mean	Number of Schools
A (New Texts and Guides)	20.137	12
B (New Texts)	19.475	12
C (Other Texts)	20.667	12

All Pre and Post Test Means

Pre Test Mean	Post Test Mean	Number of Schools
12.876	27.309	36

Pre and Post Test Means of Schools Assigned to Field Conditions

Field Conditions	Pre Test Mean	Post Test Mean	Number of Schools
A	12.869	27.406	12
B	12.426	26.524	12
C	13.335	27.999	12

TABLE XB (Continued)

Pre and Post Test Means of Schools by Types

Type of School	Pre Test Mean	Post Test Mean	Number of Schools
Completa	14.137	29.079	12
Pluridocente	11.245	26.913	12
Unitaria	13.248	25.937	12

TABLE XC

Science Pre and Post Test Means
For Types of Schools (U, Pl, Com.)
and According to Field Conditions (A, B, C)

Combined Pre and Post Test Means of Schools by Type

Type of School	Pre and Post Mean	Number of Schools
Completa	23.328	12
Pluridocente	21.867	12
Unitaria	21.832	12

Combined Pre and Post Test Means of Schools by Field Conditions

Field Condition	Pre and Post Mean	Number of Schools
A (New Texts and Guides)	22.723	12
B (New Texts)	21.178	12
C (Other Texts)	23.125	12

All Pre and Post Test Means

Pre Test Mean	Post Test Mean	Number of Schools
16.271	28.413	36

Pre and Post Test Means of Schools Assigned to Field Conditions

Field Conditions	Pre Test Mean	Post Test Mean	Number of Schools
A	16.478	28.969	12
B	15.039	27.316	12
C	17.297	28.953	12

TABLE XC (Continued)

Pre and Post Test Means of Schools by Types

Type of School	Pre Test Mean	Post Test Mean	Number of Schools
Completa	16.269	27.394	12
Pluridocente	15.428	28.305	12
Unitaria	17.117	29.539	12

TABLE XI

Items Which Fifty Percent or More of Students Scored Correctly on Pre and Post Tests on Coast and Sierra

	Coast Item Numbers	Sierra Item Numbers
Reading		
Pre Test	1-20, 22	1-7, 10, 11, 13, 14, 17, 19
Post Test	1-25, 28-33	1-24, 28-33, 37-42
Mathematics		
Pre Test	1-8, 10-13, 15-18	1-8
Post Test	1-13, 15-19, 24-26, 29, 35, 41, 44	1-8, 10-13, 15-18, 20, 24-29, 32, 33, 36, 38, 39, 41, 43, 47
Science		
Pre Test	1, 2, 4-21	1, 2, 5, 7, 8, 10, 15-19, 21
Post Test	1, 2, 4-22, 24, 25, 29, 38, 40, 41, 44, 46	1, 2, 4-24, 26, 28, 29, 38, 40, 41-46, 48

TABLE XII

Number of Pages of New Textbooks Completed by Students in Selected Schools, As Reported by Teachers of the Coast and Sierra Textbook and Field Conditions

Province and School	Reading		Mathematics		Science	
	A	B	A	B	A	B
Chimborazo						
1	108		76		93	
2	116		138		95	
3	130		139		93	
4	130		156		104	
5	103		153		100	
6		100		130		102
7		85		180		95
8		170		140		111
9		103		107		67
Imbabura						
1	123		107		126	
2	103		152		104	
3	148		160		132	
4		170		170		134
5		107		172		
Loja						
1	155		161		115	
2	170		110		80	
3		130		198		134
4		130		173		124
5		158		140		80

TABLE XII

(Continued)

Number of Pages of New Textbooks Completed by Students in Selected Schools, As Reported by Teachers of the Coast and Sierra

Textbook and Field Conditions

Province and School	Reading		Mathematics		Science	
	A	B	A	B	A	B
Pichincha						
1	170		124		134	
2	144		142		94	
3		136		93		65
Guayas						
1	70		83		36	
2	100		120		100	
3	95		131		52	
4	83		135		56	
5	100		120		68	
6	49		92		31	
7		48		102		77
8		38		65		24
9		91		90		93
10		72		105		100
11		93		121		74
12		79		115		124
Manabi						
1	83		94		51	
2	75		101		90	
3	91		86		76	
4	69		86		56	
5		71		139		81
6		57		86		31
7		50		180		134
8		60		97		43

TABLE XIII

Median Pages Completed in New Textbooks, According to Teacher Report in Coast and Sierra Schools

Schools	Reading	Mathematics	Science
Coast	74	102	71
Sierra	130	140	102
Condition A	103	122	93
Condition B	92	126	93
All Schools	100	123	93
Total Number of Pages in Text	170	217	134

TABLE XIV

Medians of Pre and Post Tests for Sierra and Coast Schools

	Sierra		Coast	
	Pre Test	Post Test	Pre Test	Post Test
Reading	12	33	17	28
Mathematics	4	16	12	27
Science	8	16	18	28

TABLE XV

Medians of Pre Tests and Post Tests of Sierra Schools in the Sample and Schools Not in the Sample

	Schools in the Study			Schools Not in the Study		
	Pre Test	Post Test	Number of Schools	Pre Test	Post Test	Number of Schools
Reading	12	33	52	10	31	20
Mathematics	4	16	52	4	15	20
Science	8	16	52	8	16	20

TABLE XVI

Medians of Students of Sierra Schools
Who Took Only Pre Test Compared With
Students Who Took Pre and Post Test

	Pre Test Medians of Students in Study	Number of Students	Pre Test Medians of Students Who Took Only Pre Tes	Number of Students
Reading	12	1138	10	274
Mathematics	4	1143	4	271
Science	8	1100	8	269

Means and Standard Deviations of Schools in the Study, by Province

READING

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
IMBABURA	01	17.18	46.68	54	4.51	2.30
	04	4.90	32.04	22	4.39	5.04
	05	13.04	35.85	21	4.53	10.24
	09	15.37	33.37	8	1.68	4.83
	10	11.75	31.46	28	5.70	7.60
	11	11.55	24.14	27	5.13	7.37
	12	14.63	34.78	19	5.06	11.69
	13	12.18	37.22	22	5.79	5.76
	15	9.48	28.52	25	4.14	7.24
	16	17.70	32.70	20	4.94	6.98
	18	17.40	27.10	10	4.94	6.04
PICHINCHA	01	15.64	37.76	25	3.67	5.22
	02	11.04	32.85	21	4.67	4.49
	03	11.27	31.81	11	2.64	7.42
	05	15.50	33.68	22	5.56	5.13
	06	9.00	26.50	6	5.51	5.82
	07	9.70	39.70	27	5.36	5.38
	09	11.86	23.40	22	4.53	7.58
	10	9.35	21.52	34	3.98	6.43
	11	8.16	25.33	6	4.26	12.07
	12	9.33	25.83	24	6.21	5.62
	18	8.00	21.68	16	2.82	3.60
CHIMBORAZO	01	10.13	33.56	23	4.53	6.12
	03	10.60	32.29	41	3.49	5.63
	04	18.62	28.12	8	5.95	5.71

READING CONTINUED

TABLE XVII

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
CHIMBORAZO	05	6.75	12.70	20	2.17	5.15
	06	11.50	23.77	22	2.85	4.96
	07	8.55	23.83	18	4.34	8.38
	08	9.83	27.00	6	3.48	10.05
	09	8.54	35.31	22	3.97	6.37
	10	7.22	31.07	27	5.01	6.34
	12	6.08	27.26	34	4.83	6.67
	14	9.72	33.72	11	3.22	7.08
	15	9.51	31.85	35	4.15	4.29
	16	11.70	34.00	10	3.36	4.37
	17	11.12	40.52	25	4.00	4.97
	18	8.31	25.26	19	2.76	6.58
LOJA	01	15.84	41.00	25	3.89	5.40
	03	16.06	32.87	16	5.29	8.09
	04	15.00	31.83	18	4.76	5.12
	05	14.57	33.14	28	5.39	6.97
	06	16.80	36.50	10	3.76	4.90
	08	15.63	32.09	11	5.39	6.09
	09	13.12	31.43	16	6.05	5.98
	10	14.88	37.92	27	4.99	6.12
	11	14.08	32.08	23	4.96	6.63
	12	6.31	30.47	19	3.11	10.89
	13	12.50	31.53	28	3.45	6.74
	14	10.04	24.08	24	4.50	7.60
	15	12.15	30.23	38	3.78	5.32

READING CONTINUED

TABLE XVII

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
LOJA	16	10.75	29.03	33	4.39	7.56
	18	12.65	23.51	29	4.45	5.24

TABLE XVII

MATHEMATICS

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
IMBABURA	01	4.96	19.40	54	1.18	0.98
	04	3.20	13.40	20	2.01	2.70
	05	5.00	18.00	22	1.02	3.51
	09	4.00	18.62	8	0.92	1.06
	10	3.85	13.21	28	1.11	3.45
	11	3.75	12.28	28	1.50	3.48
	12	3.57	17.00	19	2.06	3.44
	13	4.77	18.13	22	1.68	1.83
	15	4.57	16.73	26	1.72	3.44
	16	5.15	14.20	20	1.34	2.93
	18	3.54	11.90	11	1.12	3.17
PICHINCHA	01	4.15	17.00	26	1.51	1.91
	02	4.47	16.57	21	1.16	2.95
	03	5.00	14.50	10	1.24	3.10
	05	4.81	15.86	22	2.26	2.16
	06	4.33	15.00	6	0.81	5.69
	07	5.70	17.59	27	1.38	2.69
	09	4.77	15.45	22	1.44	3.63
	10	3.40	12.85	35	1.00	3.22
	11	3.00	9.00	6	1.54	3.34
	12	4.16	15.16	24	1.68	2.88
	18	5.87	13.68	16	1.78	3.34
CHIMBORAZO	01	4.12	15.04	24	1.07	2.19
	03	5.29	15.02	41	1.38	2.93

MATHEMATICS CONTINUED

TABLE XVII

Identity	School	Pre. $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
CHIMBORAZO	04	3.00	16.71	7	0.81	1.11
	05	2.04	13.00	21	1.02	1.97
	06	3.00	13.41	24	0.65	1.34
	07	2.16	14.72	18	1.24	2.37
	08	2.83	13.50	6	0.40	4.46
	09	2.90	15.90	22	0.61	1.97
	10	2.77	16.74	27	0.57	2.15
	12	2.00	12.68	34	1.10	3.14
	14	2.54	14.81	11	1.03	2.63
	15	2.72	14.80	36	0.81	2.80
	16	3.40	10.20	10	0.84	2.34
	17	2.40	17.64	25	0.81	2.19
	18	2.31	15.57	19	1.10	2.56
LOJA	01	4.36	15.40	25	1.28	2.34
	03	4.46	16.40	15	0.83	2.74
	04	4.55	15.61	18	1.33	2.32
	05	5.00	15.25	27	1.66	2.42
	06	4.70	17.00	10	1.49	2.49
	08	5.18	15.09	11	1.66	4.03
	09	4.25	15.81	16	1.69	2.78
	10	5.33	18.07	27	1.44	2.38
	11	3.69	16.52	23	0.97	2.88
	12	3.73	16.36	19	1.09	2.24
	13	5.62	15.29	27	1.27	2.62
	14	3.55	12.33	27	0.84	2.80

MATHEMATICS CONTINUED

TABLE XVII

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
LOJA	15	5.28	16.05	39	1.55	2.75
	16	4.05	15.14	34	1.09	3.41
	18	4.14	14.28	28	1.17	3.12

TABLE XVII

SCIENCE

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
IMBABURA	01	10.92	19.98	53	2.48	1.65
	04	7.95	16.77	22	2.60	2.06
	05	7.40	17.10	20	2.25	2.75
	09	9.75	17.50	8	2.12	2.00
	10	8.67	14.96	28	2.95	3.44
	11	8.53	16.38	26	3.67	2.46
	12	8.52	14.68	19	4.38	3.72
	13	10.23	17.71	21	2.36	2.14
	15	8.61	15.11	26	3.41	3.02
	16	11.25	14.60	20	3.59	2.13
	18	8.18	14.90	11	2.56	2.58
PICHINCHA	01	10.42	17.11	26	2.46	2.51
	02	9.42	15.57	21	2.50	2.95
	03	9.80	15.00	10	3.32	1.88
	05	9.50	14.63	22	2.40	2.30
	06	9.83	14.50	6	1.72	2.58
	07	9.11	18.77	27	1.55	1.28
	09	6.80	15.14	21	2.01	3.48
	11	6.00	17.00	5	2.34	1.41
	12	6.04	14.00	24	1.92	1.44
	18	6.56	15.43	16	2.25	2.96
CHIMBORAZO	01	7.50	16.50	24	1.64	2.75
	03	7.36	17.12	41	2.16	2.34
	04	6.00	15.37	8	1.85	1.84
	05	6.50	13.61	18	2.68	1.94

SCIENCE CONTINUED

TABLE XVII

Identity	School	Pre.$\bar{X}$	Post$\bar{X}$	N	Pre σ	Post σ
CHIMBORAZO	06	7.95	15.45	24	1.87	2.66
	07	5.05	15.64	17	2.96	3.01
	08	5.50	14.83	6	3.61	5.11
	09	8.09	16.90	22	2.02	2.15
	10	6.59	16.33	27	2.63	2.44
	12	4.26	14.11	34	2.46	2.69
	14	6.45	15.81	11	2.20	3.18
	15	6.66	16.05	36	2.92	2.13
	16	7.20	16.20	10	1.68	2.25
	17	8.04	15.72	25	2.26	1.62
	18	7.68	15.31	19	2.96	3.28
LOJA	01	7.88	17.08	25	1.69	2.21
	03	8.27	16.88	18	1.40	3.41
	04	9.06	15.93	16	1.12	2.14
	05	7.96	14.78	28	1.99	3.18
	06	7.70	18.40	10	1.49	2.27
	08	8.27	15.81	11	1.73	2.56
	09	6.93	16.40	15	2.84	3.33
	10	8.51	17.44	27	1.88	2.17
	11	8.18	15.18	22	2.03	2.17
	12	7.11	15.61	18	2.16	2.87
	13	6.85	17.92	28	1.81	2.58
	14	7.50	15.30	26	1.63	2.51
	15	8.64	15.82	39	1.61	2.60
	16	7.94	16.70	34	2.01	2.80
	18	8.44	15.93	29	1.76	2.78

TABLE XVII

READING

Identity	School	Pre $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
Manabi	01	17.43	26.45	37	4.30	4.07
	02	19.54	28.91	24	5.70	10.76
	03	23.12	35.36	33	6.28	12.11
	04	17.93	34.58	31	4.94	10.85
	05	28.42	21.00	14	2.31	7.58
	06	29.55	20.80	20	1.76	7.06
	07	11.51	28.42	33	0.75	7.83
	08	16.39	20.82	23	2.95	5.09
	09	11.50	17.04	24	2.84	3.78
	10	30.04	34.40	22	1.17	5.33
	11	21.69	30.53	13	3.03	5.79
	12	13.55	17.41	29	5.26	7.27
	13	21.20	24.16	30	3.96	7.41
	14	23.85	24.90	20	5.09	7.39
	15	23.14	26.33	21	5.17	6.48
	16	16.57	22.46	28	4.14	6.86
	17	29.21	30.57	19	2.59	4.24
	18	29.67	29.45	37	1.52	10.71
Guayas	01	13.78	29.42	14	7.04	7.16
	02	12.37	23.37	16	4.52	5.43
	03	12.62	17.12	8	3.54	5.35
	04	17.23	30.58	17	5.28	5.63
	05	12.86	25.23	30	5.62	8.40
	06	13.36	17.18	22	7.21	8.20
	07	12.78	22.46	28	5.52	9.91

Reading Continued

TABLE XVII

Identity	School	Pre $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
Guayas	08	19.00	30.50	30	5.05	8.16
	09	11.11	32.00	17	3.15	5.98
	10	14.43	27.16	30	7.04	4.82
	11	10.57	44.63	19	3.53	3.60
	12	12.57	36.73	26	4.96	7.40
	13	12.74	38.41	31	4.60	5.12
	14	18.44	29.22	9	6.61	11.86
	15	11.51	22.79	29	6.12	5.21
	16	16.39	30.78	23	5.04	7.14
	17	18.00	31.56	30	4.54	6.95
	18	15.38	31.77	18	5.56	10.18

TABLE XVII

MATHEMATICS

Identity	School	Pre $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
Manabi	01	12.21	27.97	37	2.46	5.03
	02	15.20	21.20	25	2.04	6.55
	03	12.33	23.57	33	3.82	7.36
	04	14.54	32.21	33	2.48	7.59
	05	16.37	28.25	16	1.40	4.66
	06	16.70	23.65	20	1.21	4.79
	07	16.27	26.72	33	1.15	6.06
	08	14.00	21.30	23	2.17	5.00
	09	14.25	20.12	24	2.26	5.94
	10	17.52	30.60	23	0.51	5.13
	11	10.46	30.92	13	2.53	5.72
	12	11.96	18.93	29	3.66	8.34
	13	15.83	26.22	31	2.73	6.29
	14	14.22	22.05	18	3.13	5.37
	15	14.19	27.09	21	2.40	4.90
	16	14.69	21.15	26	3.18	4.83
	17	17.26	25.31	19	1.09	5.29
	18	16.62	22.18	37	0.79	6.07
Guayas	01	8.92	30.07	14	1.81	7.44
	02	8.93	25.56	16	3.47	3.79
	03	10.87	22.50	8	2.23	3.20
	04	12.23	26.41	17	1.98	4.95
	05	9.83	24.58	31	2.95	7.00
	06	10.50	26.45	24	3.32	6.61
	07	11.00	22.14	28	2.74	6.46
	08	10.63	27.93	30	3.26	5.20

Mathematics Continued

TABLE XVII

Identity	School	Pre $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
Guayas	09	6.52	39.05	17	2.42	3.49
	10	12.53	34.26	30	4.34	6.59
	11	14.36	43.21	19	2.75	4.49
	12	11.22	37.14	27	3.23	6.74
	13	12.25	29.06	31	2.32	5.83
	14	11.11	32.44	9	3.25	8.07
	15	8.31	25.34	29	2.72	6.04
	16	10.39	26.43	23	2.87	6.19
	17	11.53	30.80	30	3.05	5.64
	18	9.82	30.35	17	4.39	7.27

TABLE XVII

SCIENCE

Identity	School	Pre $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
Manabi	01	18.18	25.21	37	2.89	3.69
	02	17.69	26.17	23	4.24	6.44
	03	17.33	32.24	33	3.22	7.83
	04	16.63	38.21	33	4.08	6.14
	05	19.87	25.31	16	2.96	2.93
	06	20.11	21.11	18	1.32	5.08
	07	17.73	26.17	34	2.71	7.59
	08	12.91	23.56	23	2.84	4.09
	09	17.73	23.91	23	2.84	4.42
	10	20.91	30.17	23	0.28	7.85
	11	13.92	29.23	13	2.98	3.98
	12	16.55	17.31	29	3.85	4.57
	13	18.29	25.41	31	2.69	4.68
	14	17.05	28.10	19	2.95	4.99
	15	17.33	23.90	21	2.63	5.96
	16	18.96	23.31	29	2.29	5.95
	17	20.65	30.25	20	0.48	3.36
	18	20.78	31.63	38	0.57	7.27
Guayas	01	14.42	28.21	14	4.34	6.88
	02	12.56	26.68	16	3.75	3.32
	03	11.87	28.25	8	4.05	3.61
	04	15.64	29.82	17	3.80	5.13
	05	14.40	25.43	30	3.90	6.83
	06	12.04	23.12	24	5.36	3.65
	07	12.40	27.11	27	3.78	7.47

Science Continued

TABLE XVII

Identity	School	Pre $\bar{X}$	Post $\bar{X}$	N	Pre σ	Post σ
Guayas	08	15.50	30.76	30	3.22	7.50
	09	16.88	39.23	17	4.12	3.54
	10	17.30	30.06	30	5.15	3.93
	11	18.36	39.57	19	4.04	4.08
	12	16.07	27.44	27	4.15	7.42
	13	15.76	33.43	30	3.22	6.27
	14	14.66	34.00	9	6.67	5.36
	15	11.72	28.51	29	4.19	5.62
	16	12.82	28.73	23	4.28	5.02
	17	16.06	31.66	30	3.00	4.58
	18	15.11	29.66	18	3.96	6.18

TABLE XVIII

Characteristics of Schools and Social Substantive Measures

Province	Field Condition	Urban Rural	School Type	Total Years Teaching	Years Teaching First Grade	Reading			Mathematics			Science		
						SS_1	SS_2	SS_3	SS_1	SS_2	SS_3	SS_1	SS_2	SS_3
Imbabura	C	U	C	10	1	40	66	1	45	65	0	54	58	1
	C	R	C	23	1	72	58	8	48	55	3	74	61	8
	C	U	C	8	1	26	59	0	31	73	0	82	59	2
	A	R	P1	17	2	24	56	1	16	61	4	82	44	5
	B	R	U	16	3	61	74	2	81	58	2	98	57	0
	B	U	C	7	2	42	64	6	75	62	7	83	48	3
	A	R	P1	4	1	57	63	5	77	57	6	75	53	2
	A	R	P1	8	2	78	62	3	42	66	1	90	76	0
	C	R	U	3	1	59	78	0	47	65	0	79	64	1
Guayas	C	R	U	5	1	38	71	3	29	60	12	82	53	8
	B	R	U	6	3	41	52	6	73	56	8	84	58	6
	B	R	U	5	1	94	74	5	84	75	13	91	79	4
	A	U	C	21	1	91	58	21	92	51	34	92	56	21
	C	R	P1	2	2	38	63	0	38	56	2	68	52	1
	B	R	P1	22	4	30	45	9	61	52	0	24	45	0
	A	R	P1	8	3	70	60	12	48	64	2	68	42	6

TABLE XVIII

(Continued)

Characteristics of Schools and Social Substantive Measures

Province	Field Condition	Urban Rural	School Type	Total Years Teaching	Years Teaching First Grade	Reading			Mathematics			Science		
						SS_1	SS_2	SS_3	SS_1	SS_2	SS_3	SS_1	SS_2	SS_3
Guayas	C	U	C	29	8	38	58	5	52	59	0	41	40	9
	B	R	Pl	6	4	74	52	7	73	57	3	69	63	3
	A	R	U	5	3	56	57	0	74	60	0	82	64	3
	C	R	C	6	1	75	50	1	51	73	2	99	67	6
	C	U	C	17	1	54	47	4	54	59	2	88	63	1
	A	R	U	3	3	52	59	0	67	59	0	77	52	4
	B	R	Pl	11	1	51	55	5	67	54	14	98	63	5
	A	U	C	6	1	53	52	6	89	47	3	79	58	1
	B	R	C	2	2	46	52	22	48	52	1	78	58	17
	A	R	Pl	8	5	45	62	6	28	56	6	54	50	8
Pichincha	A	U	C	9	1	72	61	9	69	66	2	89	61	5
	C	R	Pl	4	4	84	64	3	100	63	1	81	50	2
	C	R	U	8	6	38	66	2	30	61	0	100	70	1
	C	R	Pl	5	5	26	62	0	87	64	2	83	69	3
	A	R	U	20	4	41	73	0	35	66	0	82	69	1
	A	R	U	5	5	61	56	0	25	63	2	88	65	2
	C	R	Pl	9	1	56	39	4	37	51	1	84	51	3

TABLE XIX

Selected Pearson Product Moment Correlation Coefficients, Years in Service and Gains[1]

	Years in Grade 1	Reading Gain	Math Gain	Science Gain
Total Years of Service	.228	.074	-.145	.024
Years in Grade 1		-.220	.108	.012
Reading Gain			.172	-.254
Mathematics Gain				.610 xxx

x Significant at .05 level
xx Significant at .01 level
xxx Significant at .001 level

[1] Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

TABLE XX

Selected Pearson Product Moment Correlation Coefficients, Social Substantive Schedule and Reading Class Observations in 33 Schools

	Total Years Service	Years in Grade 1	Social Substantive 1	Social Substantive 2	Social Substantive 3
Reading Gain	.074	-.220	.076	.030	-.111
Total Years Service		.228	-.089	-.143	.189
Years in Grade 1			-.274	.035	-.139
Social Substantive 1				.082	.314
Social Substantive 2					-.284

x Significant at .05 level
xx Significant at .01 level

TABLE XXI

Selected Pearson Product Moment Correlation Coefficients, Social Substantive Schedule and Mathematics Class Observations in 33 Schools

	Total Years Service	Years in Grade 1	Social Substantive 1	Social Substantive 2	Social Substantive 3
Mathematics Gain	-.145	.108	.120	-.300	.013
Total Years Service		.228	-.090	-.201	.145
Years in Grade 1			-.084	-.038	-.301
Social Substantive 1				-.158	.323
Social Substantive 2					-.217

x Significant at .05 level
xx Significant at .01 level

TABLE XXII

Selected Pearson Product Moment Correlation Coefficients, Social Substantive Schedule and Science Class Observations in 32 Schools

	Total Years Service	Years in Grade 1	Social Substantive 1	Social Substantive 2	Social Substantive 3
Science Gain	.024	.012	-.201	-.111	.359 x
Total Years Service		.228	-.325	-.262	.193
Years in Grade 1			-.363 xx	-.173	-.066
Social Substantive 1				.581 xxx	.023
Social Substantive 2					-.204

x Significant at .05 level
xx Significant at .01 level
xxx Significant at .001 level

TABLE XXIII

Social Substantive Schedule 1 Intercorrelations[1]

	Social Substantive 1 Math	Social Substantive 1 Science
Social Substantive 1 Reading	.443 x	.351 x
Social Substantive 1 Math		.123

x Significant at .05 level
xx Significant at .01 level

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[1] Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

TABLE XXIV

Social Substantive Schedule 2
Intercorrelations[1]

	Social Substantive 2 Math	Social Substantive 2 Science
Social Substantive 2 Reading	.470 xx	.255
Social Substantive 2 Math		.429 x

x Significant at .05 level
xx Significant at .01 level

[1] Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

TABLE XXV

Social Substantive Schedule 3 Intercorrelations[1]

	Social Substantive 3 Math	Social Substantive 3 Science
Social Substantive 3 Reading	.501 xx	.779 xxx
Social Substantive 3 Math		.634 xxx

x Significant at .05 level
xx Significant at .01 level
xxx Significant at .001 level

[1] Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

TABLE XXVI

Multiple Regression Data:
Five Predictors for Subject Matter Gain[1]

	Multiple Correlation	Percentage of Variance Explained by Five Predictors
Reading Gain	.319	10%
Mathematics Gain	.399	16%
Science Gain	.447	20%

[1] Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

TABLE XXVII

Partial Correlations of Five Predictors to Subject Matter Gain[1]

	Reading Gain	Mathematics Gain	Science Gain
Total years Experience	.177	-.238	-.126
Years Experience in Grade 1	-.254	.154	-.034
Social Substantive 1	.081	.058	-.273
Social Substantive 2	-.001	-.327	.116
Social Substantive 3	-.191	.004	.401

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[1] Reading and mathematics observations were taken in 33 schools, Science observations were taken in 32 schools.

TABLE 1 A

Analysis of Variance Summary Table for Reading Pre and Post Tests in Urban and Rural Schools of the Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	8.06	1	8.06	2.423
Error (U-R)	166.48	50	3.32	
Within Schools				
Pre-Post (PP)	3261.21	1	3261.21	1732.385 xx
U-R x PP	3.39	1	3.39	1.803
Residual	94.12	50	1.88	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 1 B

Analysis of Variance Summary Table for Reading Pre and Post Tests in Urban and Rural Schools of the Coast

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	0.00	1	0.00	0.000
Error (U-R)	1398.29	34	41.12	
Within Schools				
Pre-Post (PP)	1750.34	1	1750.34	47.526 xx
U-R x PP	44.20	1	44.20	1.200
Residual	1252.19	34	36.82	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 1 C

Analysis of Variance Summary Table for Reading Pre and Post Tests in Urban and Rural Schools of Coast and Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	64.91	1	64.91	1.919
Error (U-R)	2908.53	86	33.82	
Within Schools				
Pre-Post (PP)	10375.06	1	10375.06	326.898 xx
U-R x PP	142.67	1	142.67	4.495 x
Residual	2729.46	86	31.73	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 2 A

Analysis of Variance Summary Table for Mathematics Pre and Post Tests in Urban and Rural Schools of the Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	8.06	1	8.06	2.423
Error (U-R)	166.48	50	3.32	
Within Schools				
Pre-Post (PP	3261.21	1	3261.21	1732.385 xx
U-R x PP	3.39	1	3.39	1.803
Residual	94.12	50	1.88	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 2 B

Analysis of Variance Summary Table
for Mathemathics Pre and Post Tests in
Urban and Rural Schools of the Coast

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	30.12	1	30.12	2.168
Error (U-R)	472.35	34	13.89	
Within Schools				
Pre-Post (PP	3749.63	1	3749.63	160.772 xx
U-R x PP	40.61	1	40.61	1.741
Residual	792.96	34	23.32	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 2 C

Analysis of Variance Summary Table for Mathematics Pre and Post Tests in Urban and Rural Schools of the Coast and Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	.50	1	.50	.008
Error (U-R)	5370.27	86	62.44	
Within Schools				
Pre-Post (PP)	6899.64	1	6899.64	572.970 xx
U-R x PP	6.70	1	6.70	.556
Residual				

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 3 A

Analysis of Variance Summary Table
For Science Pre and Post Tests in
Urban and Rural Schools of the Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	7.77	1	7.77	3.384
Error (U-R)	112.59	49	2.29	
Within Schools				
Pre-Post (PP)	1671.51	1	1671.51	1199.302 xx
U-R x PP	.84	1	.84	.603
Residual	68.29	49	1.39	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 3 B

Analysis of Variance Summary Table
For Science Pre and Post Tests in
Urban and Rural Schools of the Coast

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban - Rural (U-R)	0.00	1	0.00	.000
Error (U-R)	543.80	34	15.99	
Within Schools				
Pre-Post (PP)	2653.31	1	2653.31	182.816 xx
U-R x PP	5.12	1	5.12	.352
Residual	493.46	34	14.51	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 3 C

Analysis of Variance Summary Table
For Science Pre and Post Tests in
Urban and Rural Schools of the Coast and Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Urban-Rural (U-R)	14.77	1	14.77	.222
Error (U-R)	5720.76	86	66.52	
Within Schools				
Pre-Post (PP)	4105.01	1	4105.01	448.312 xx
U-R x PP	.06	1	.06	.007
Residual	787.46	86	9.15	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 4 A

Analysis of Variance Summary Table For Reading Pre and Post Tests of Sierra in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	59.13	2	29.56	1.005
Error (A,B,C)	1440.45	49	29.39	
Within Schools				
Pre-Post (PP)	9544.36	1	9544.36	746.042 xx
(A,B,C) x PP	29.22	2	14.61	1.142
Residual	626.87	49	12.79	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 4 B

Analysis of Variance Summary Table
For Reading Pre and Post Tests of
Coast in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	299.28	2	149.64	4.493 [x]
Error (A,B,C)	1099.01	33	33.30	
Within Schools				
Pre-Post (PP)	1750.34	1	1750.34	45.369 [xx]
(A,B,C) x PP	23.27	2	11.63	.301
Residual	1273.12	33	38.57	

[x] F ratio significant at .05 level

[xx] F ratio significant at .01 level

TABLE 4 C

Analysis of Variance Summary Table For Reading Pre and Post Tests of Coast and Sierra in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	97.26	2	48.63	1.437
Error (A, B, C)	2876.17	85	33.83	
Within Schools				
Pre-Post (PP)	10375.06	1	10375.06	307.246 xx
(A,B,C) x PP	1.86	2	.93	.027
Residual	2870.27	85	33.76	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 5 A

Analysis of Variance Summary Table For Mathematics Pre and Post Tests of Sierra Schools in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	13.40	2	6.70	2.037
Error (A,B,C)	161.14	49	3.28	
Within Schools				
Pre-Post (PP)	3261.21	1	3261.21	1796.654 xx
(A,B,C) x PP	8.57	2	4.28	2.362
Residual	88.94	49	1.81	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 5 B

Analysis of Variance Summary Table
For Mathematics Pre and Post Tests of
Coast Schools in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	17.11	2	8.55	.581
Error (A,B,C)	485.36	33	14.70	
Within Schools				
Pre-Post (PP)	3749.63	1	3749.63	148.630 xx
(A,B,C,) x PP	1.06	2	.53	.021
Residual	832.52	33	25.22	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 5 C

Analysis of Variance Summary Table
For Mathematics Pre and Post Tests of
Coast and Sierra Schools in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	9.69	2	4.84	.076
Error (A,B,C)	5361.07	85	63.07	
Within Schools				
Pre-Post (PP)	6899.64	1	6899.64	564.737 xx
(A,B,C) x PP	3.82	2	1.91	.156
Residual	1038.48	85	12.21	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 6 A

Analysis of Variance Summary Table
For Science Pre and Post Tests of
Sierra Schools in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	4.57	2	2.28	.947
Error (A,B,C)	115.79	48	2.41	
Within Schools				
Pre-Post (PP)	1671.51	1	1671.51	1163.625 xx
(A,B,C) x PP	.18	2	.09	.063
Residual	68.95	48	1.43	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 6 B

Analysis of Variance Summary Table
For Science Pre and Post Tests of
Coast Schools in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	50.72	2	25.36	1.697
Error (A,B,C)	493.07	33	14.94	
Within Schools				
Pre-Post (PP)	2653.31	1	2653.31	176.415 xx
(A,B,C) x PP	2.25	2	1.12	.075
Residual	496.32	33	15.04	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 6 C

Analysis of Variance Summary Table For Science Pre and Post Tests of Sierra and Coast Schools in Three Field Conditions

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Conditions (A,B,C)	3.73	2	1.86	.027
Error (A,B,C)	5731.80	85	67.43	
Within Schools				
Pre-Post (PP)	4105.01	1	4105.01	445.827 xx
(A,B,C) x PP	4.88	2	2.44	.265
Residual	782.64	85	9.20	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 7 A

Analysis of Variance Summary Table For Reading Pre and Post Tests in Three Types of Schools of Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types of School (C, Pl, U.)	220.54	2	110.27	4.224 x
Error (C, Pl, U)	1279.04	49	26.10	
Within Schools				
Pre-Post (PP)	9544.36	1	9544.36	1095.540 xx
(C, Pl, U) x PP	229.20	2	114.60	13.154 xx
Residual	426.88	49	8.71	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 7 B

Analysis of Variance Summary Table For Reading Pre and Post Tests in Three Types of Schools of Coast

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C,Pl,U)	228.46	2	114.23	3.222
Error (C,Pl,U)	1169.82	33	35.44	
Within Schools				
Pre-Post (PP)	1750.34	1	1750.34	47.455 xx
(C,Pl,U) x PP	79.23	2	39.61	1.074
Residual	1217.16	33	36.88	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 7 C

Analysis of Variance Summary Table For Reading Pre and Post Tests in Three Types of Schools of Coast and Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, Pl, U)	282.64	2	141.32	4.464 x
Error (C, Pl, U)	2690.80	85	31.65	
Within Schools				
Pre-Post (PP)	10375.06	1	10375.06	346.397 xx
(C, Pl, U) x PP	330.23	2	165.11	5.521 xx
Residual	2541.89	85	29.90	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 8 A

Analysis of Variance Summary Table
For Mathematics Pre and Post Tests in
Three Types of Schools of Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, P1, U)	19.61	2	9.80	3.101
Error (C, P1, U)	154.94	49	3.16	
Within Schools				
Pre-Post (PP)	3261.21	1	3261.21	1801.091 xx
(C, P1, U) x PP	8.79	2	4.39	2.429
Residual	88.72	49	1.81	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 8 B

Analysis of Variance Summary Table
For Mathematics Pre and Post Tests in
Three Types of Schools of Coast

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, Pl, U)	116.46	2	58.23	4.978 x
Error (C, Pl, U)	386.01	33	11.69	
Within Schools				
Pre-Post	3749.63	1	3749.63	148.927 xx
(C, Pl, U) x PP	2.72	2	1.36	.054
Residual	830.85	33	25.17	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 8 C

Analysis of Variance Summary
For Mathematics Pre and Post Tests
in Three Types of Schools of Coast and Sierra

Source	Sums Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, P1, U)	23.11	2	11.55	.183
Error (C, P1, U)	5347.66	85	62.91	
Within Schools				
Pre-Post (PP)	6899.64	1	6899.64	564.765 xx
(C, P1, U) x PP	3.87	2	1.93	.158
Residual	1038.43	85	12.21	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 9 A

Analysis of Variance Summary Table
For Science Pre and Post Tests
in Three Types of Schools of Sierra

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, Pl, U)	20.06	2	10.03	4.801 x
Error (C, Pl, U)	100.30	48	2.08	
Within Schools				
Pre-Post (PP)	1671.51	1	1671.51	1244.092 xx
(C, Pl, U) x PP	4.64	2	2.32	1.727
Residual	64.49	48	1.34	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 9 B

Analysis of Variance Summary Table
For Science Pre and Post Tests in
Three Types of Schools of Coast

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, Pl, U)	35.27	2	17.63	1.144
Error (C, Pl, U)	508.53	33	15.41	
Within Schools				
Pre-Post (PP)	2653.31	1	2653.31	176.838 xx
(C, Pl, U) x PP	3.44	2	1.72	.114
Residual				

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 9 C

Analysis of Variance Summary Table For Science Pre and Posts Tests In Three Types of Schools of Coast and Sierra

Sources	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Types (C, Pl, U)	26.90	2	13.45	.200
Error (C, Pl, U)	5708.63	85	67.16	
Within Schools				
Pre-Post (PP)	4105.01	1	4105.01	444.162 xx
(C, Pl, U) x PP	1.95	2	.97	.105
Residual	785.58	85	9.24	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 10 A

Analysis of Variance Summary Table
For Type (C, Pl, U) and Field Conditions
(A, B, C) of Schools of the Coast for Reading

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Type (T)	139.58	2	69.79	2.18
Field Conditions (F)	299.28	2	149.64	4.66[x]
T x F	93.22	4	23.30	0.73
Error	866.20	27	32.08	
Within Schools				
Pre-Post (PP)	1750.34	1	1750.34	43.07[xx]
(PP) x T	63.28	2	31.64	0.78
(PP) x F	23.27	2	11.63	0.29
(PP) x T x F	112.66	4	28.16	0.69
Residual	1097.17	27	40.63	

x F ratio significant at .05 level

xx F ratio significant at .01 level

TABLE 10 B

Analysis of Variance Summary Table
For Type (C, Pl, U) and Field Conditions
(A, B, C) of Schools of the Coast for Mathematics

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Type (T)	85.78	2	42.89	2.958
Field Conditions (F)	17.11	2	8.55	.590
T x F	8.14	4	2.03	.140
Error	391.44	27	14.49	
Within Schools				
Pre-Post (PP)	3749.63	1	3749.63	132.457 xx
(PP) x T	28.95	2	14.47	.511
(PP) x F	1.06	2	.53	.018
(PP) x T x F	39.24	4	9.81	.346
Residual	764.32	27	28.30	

x F ratio significant at .05 level
xx F ratio significant at .01 level

TABLE 10 C

Analysis of Variance Summary Table
For Type (C, Pl, U) and Field Conditions
(A, B, C) of Schools of the Coast for Science

Source	Sums of Squares	Degrees of Freedom	Mean Squares	F Ratio
Between Schools				
Type (T)	35.00	2	17.50	1.171
Field Conditions (F)	50.72	2	25.36	1.698
T x F	54.84	4	13.71	.918
Error	403.23	27	14.93	
Within Schools				
Pre-Post (PP)	2653.31	1	2653.31	172.853 xx
(PP) x T	9.93	2	4.96	.323
(PP) x F	2.25	2	1.12	.073
(PP) x T x F	71.94	4	17.98	1.171
Residual	414.45	27	15.35	

x F ratio significant at .05 level
xx F ratio significant at .01 level

Distribution of Scores for Paired Students of Selected Schools:

Pre-Test - Sierra - Reading

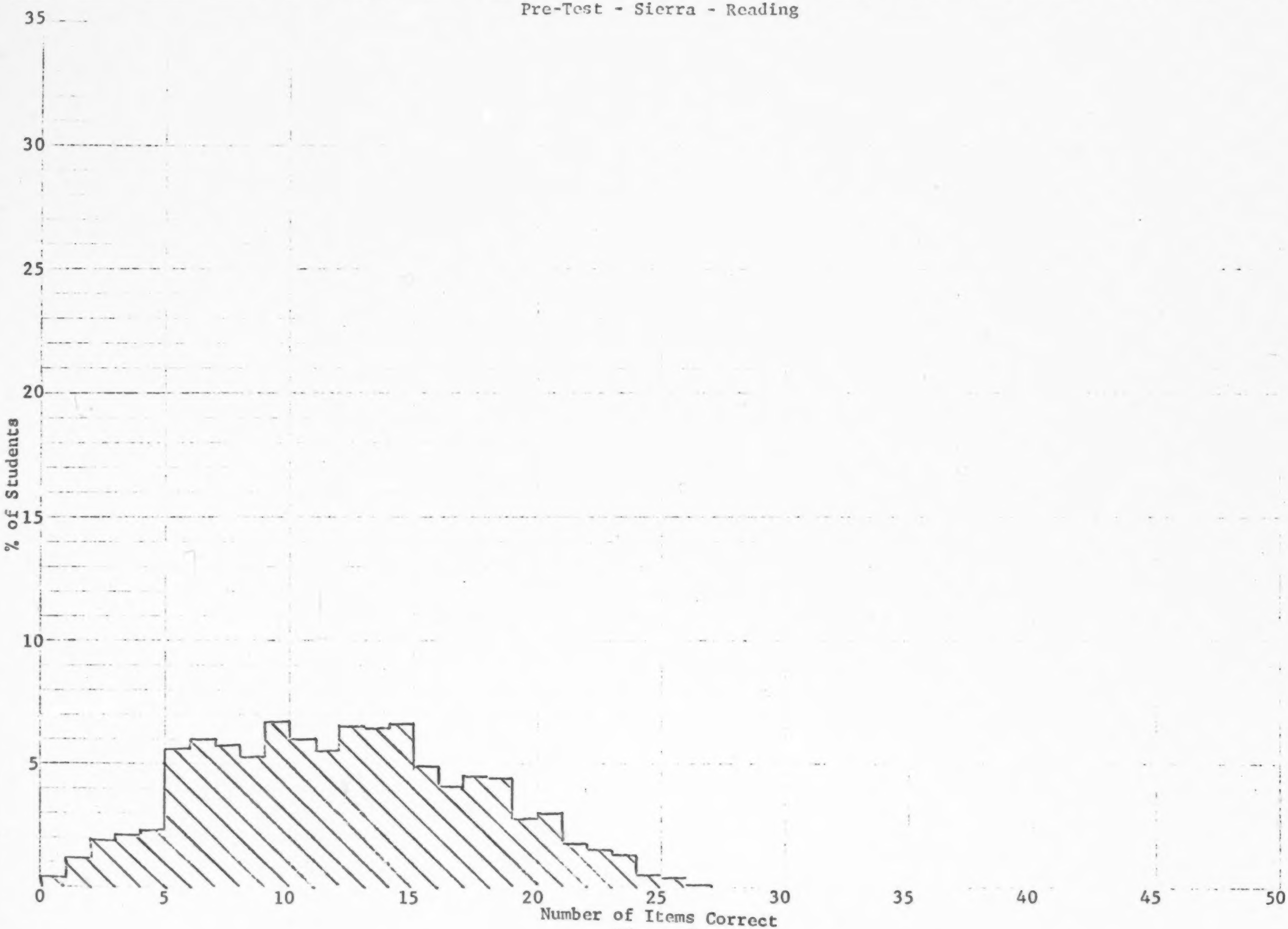


Figure I

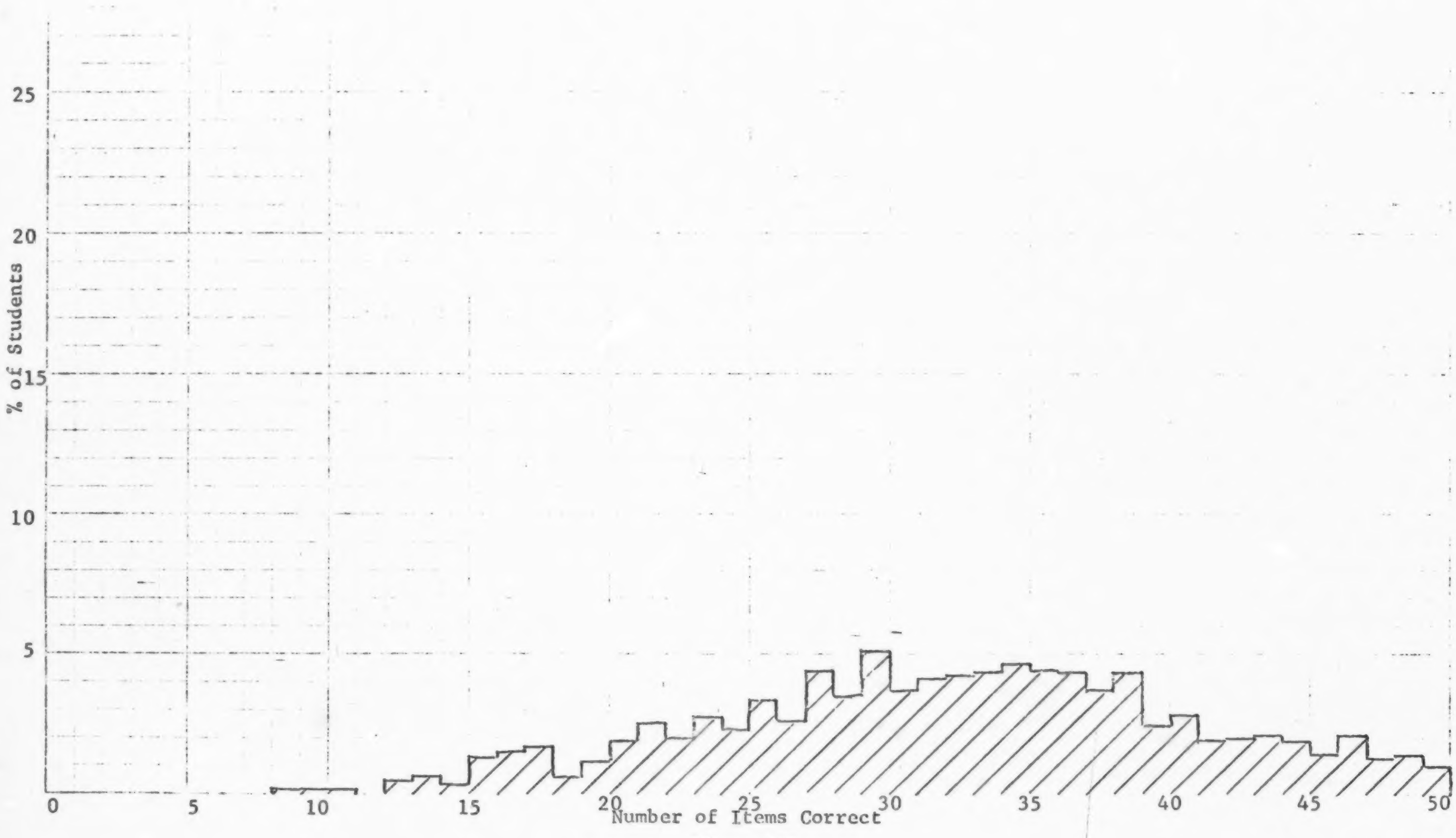
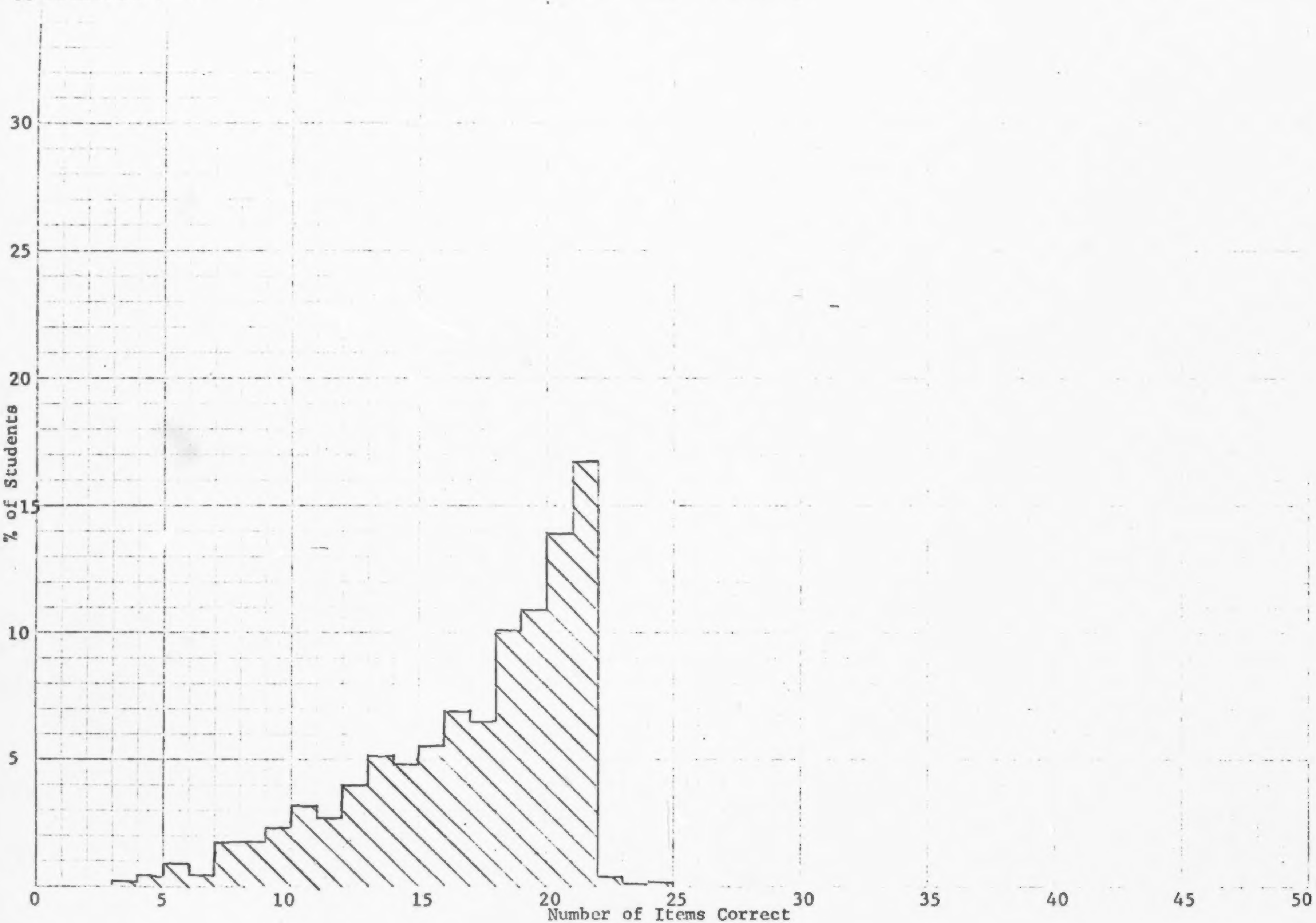

% of Students
25
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
Number of Items Correct

Figure II

Distribution of Scores of Paired Students in Selected Schools:

Pre-Test - Coast - Reading



Number of Items Correct

Figure III

Distribution of Scores for Paired Students of Selected Schools:

Post-Test - Coast - Reading

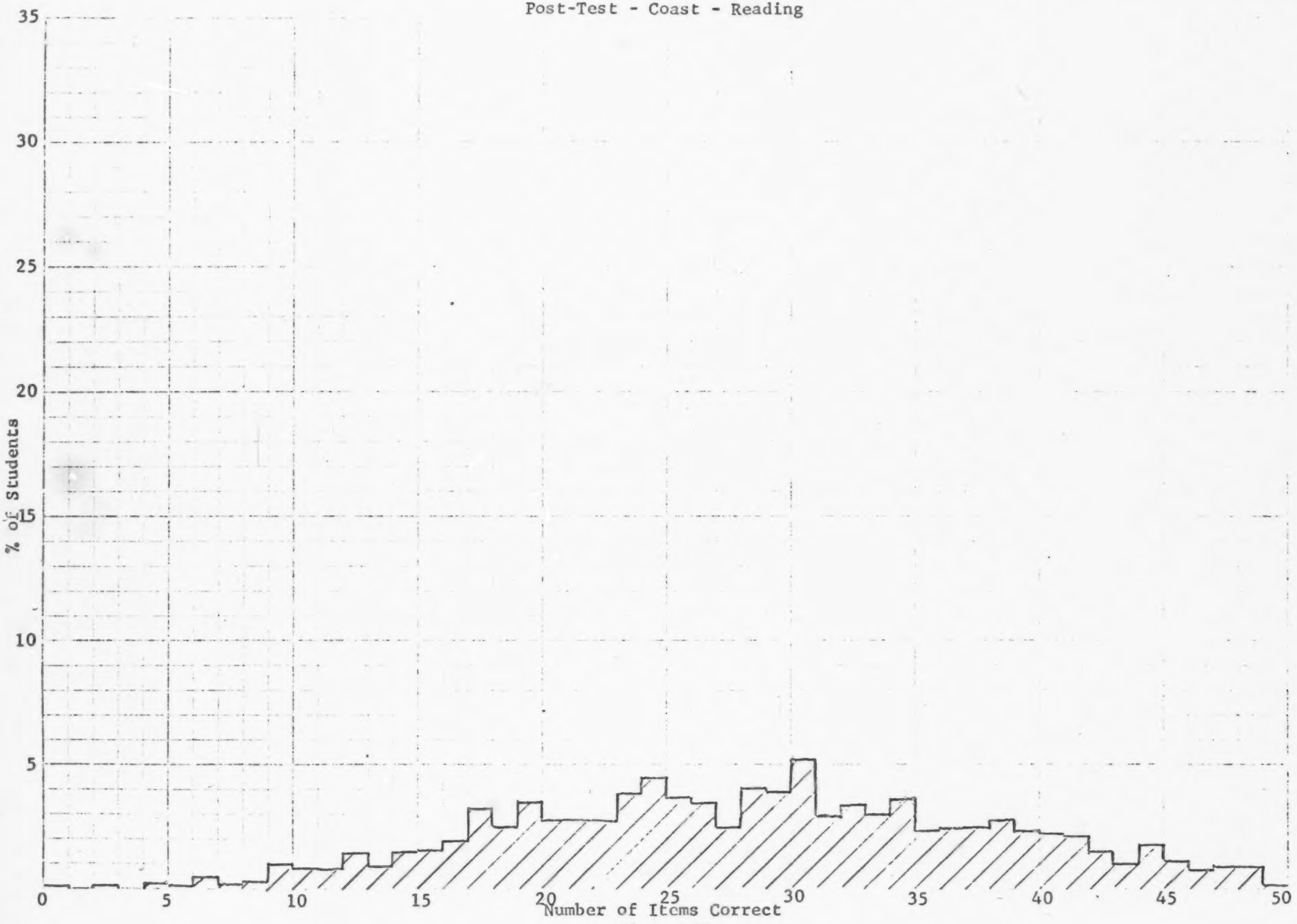


Figure IV

Distribution of Scores for Paired Students of Selected School

Pre-Test - Sierra - Math

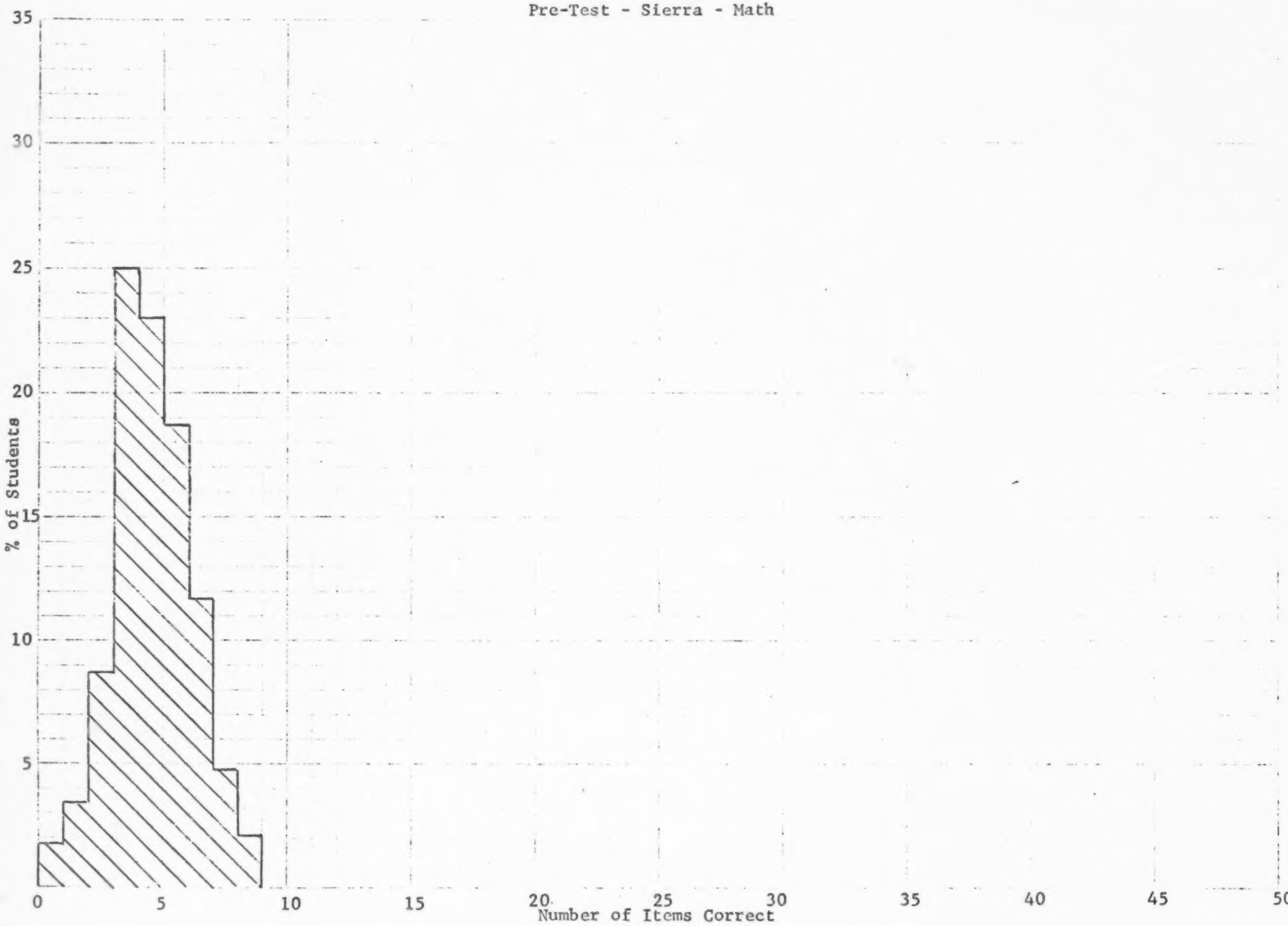


Figure V

Distribution of Scores for Paired Students of Selected Schools:

Post-Test - Sierra - Math

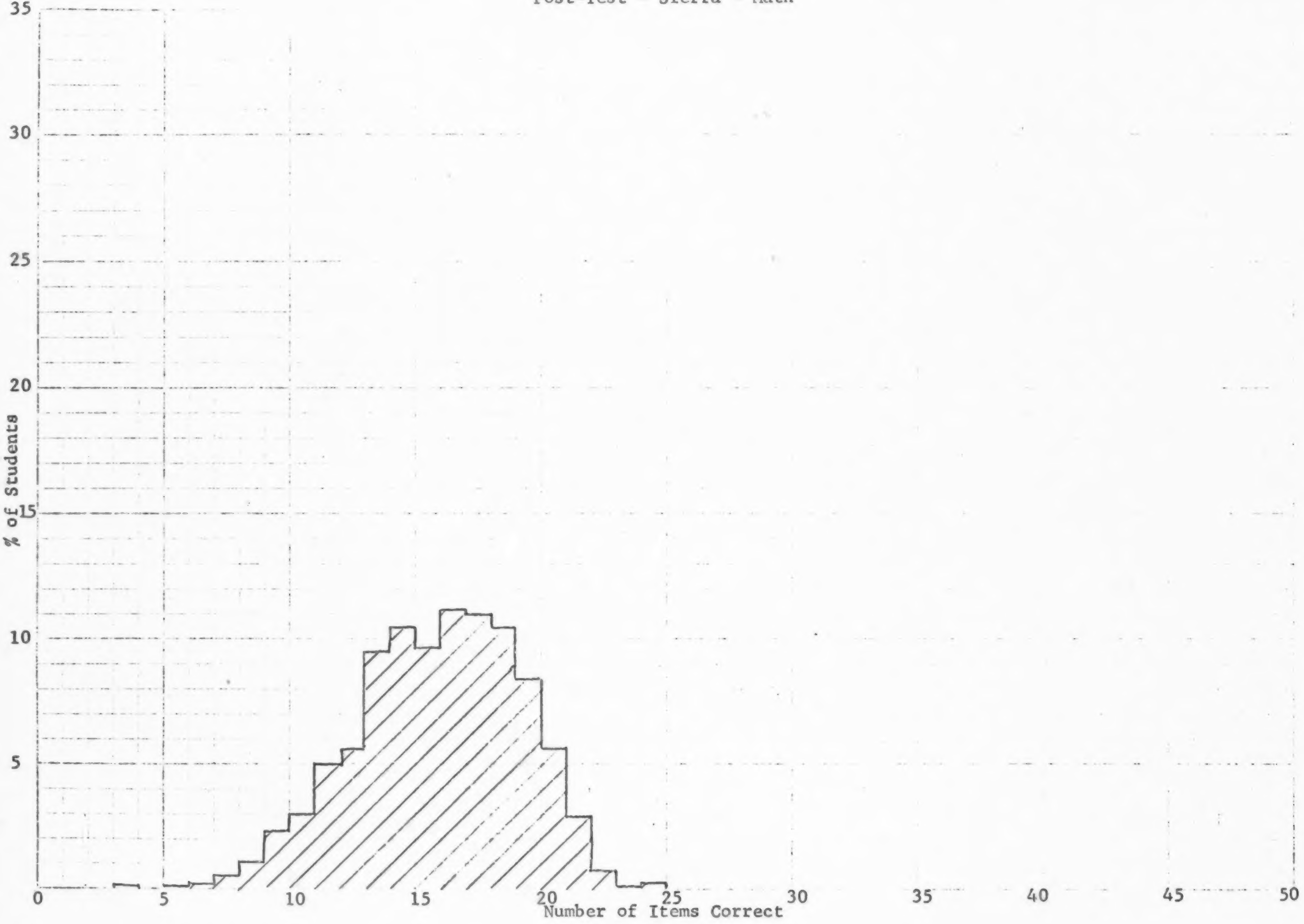


Figure VI

Distribution of Scores for Paired Students of Selected Schools

Pre-Test - Coast - Math

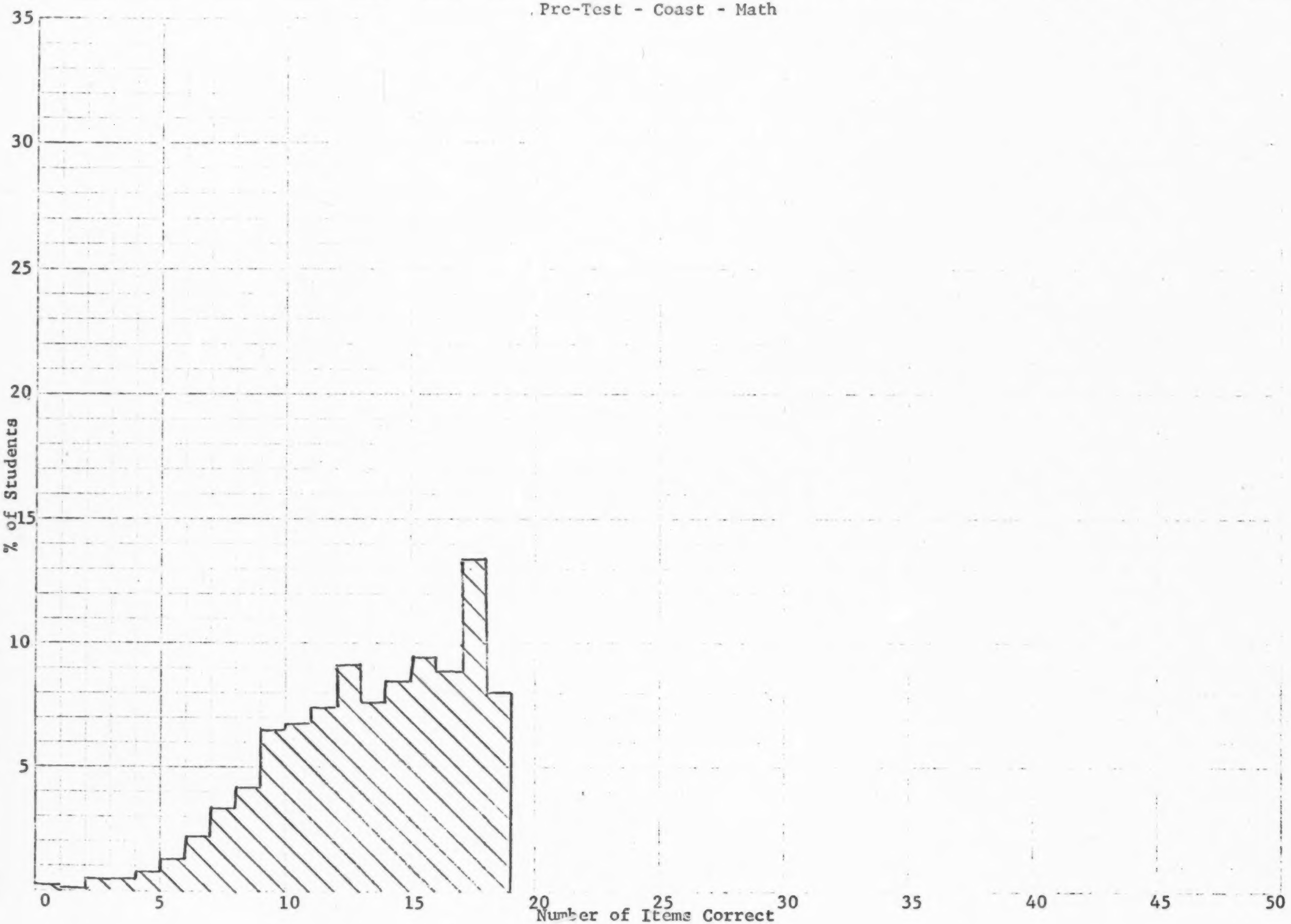


Figure VII

Distribution of Scores for Paired Students of Selected Schools

Post-Test - Coast - Math

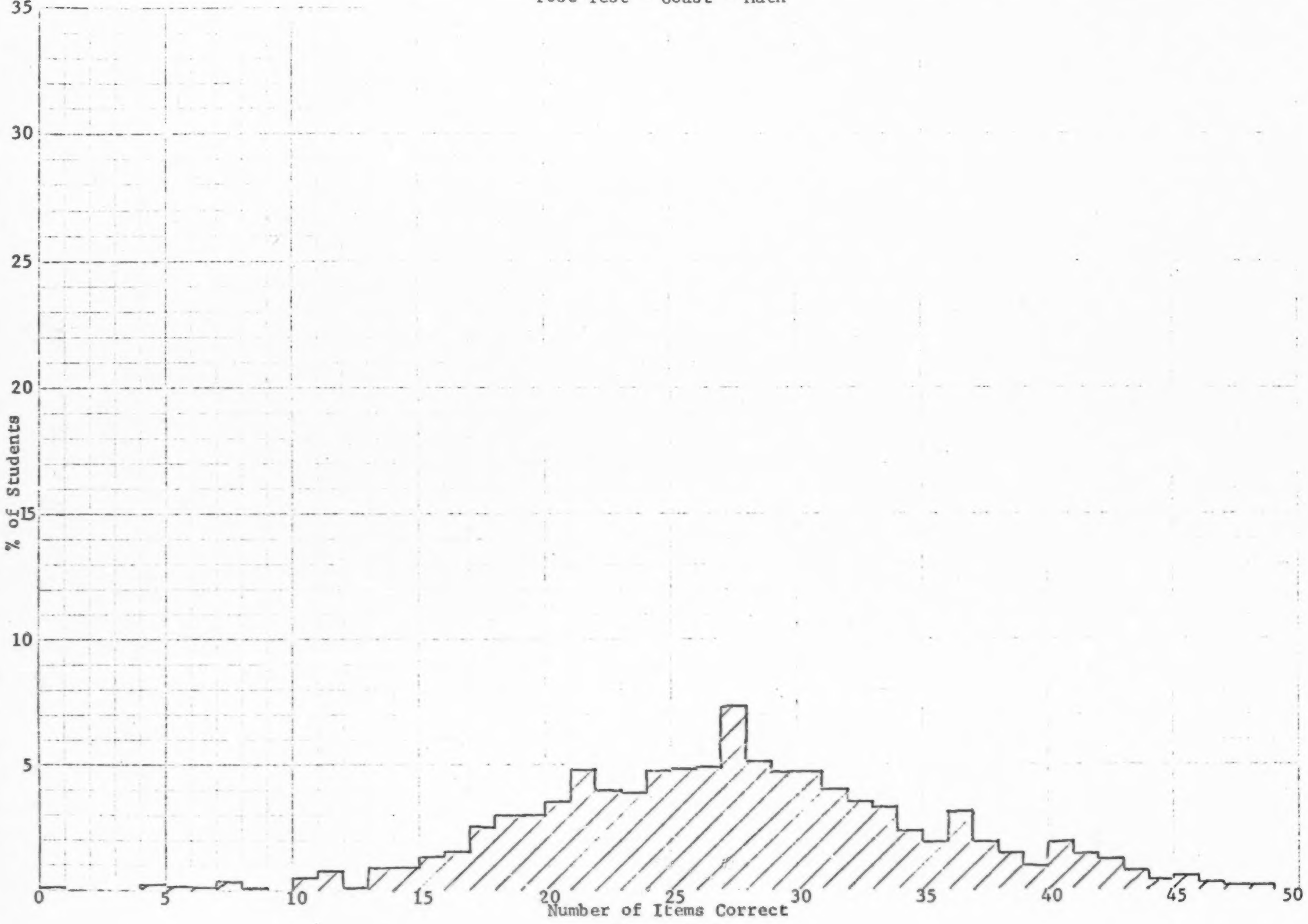
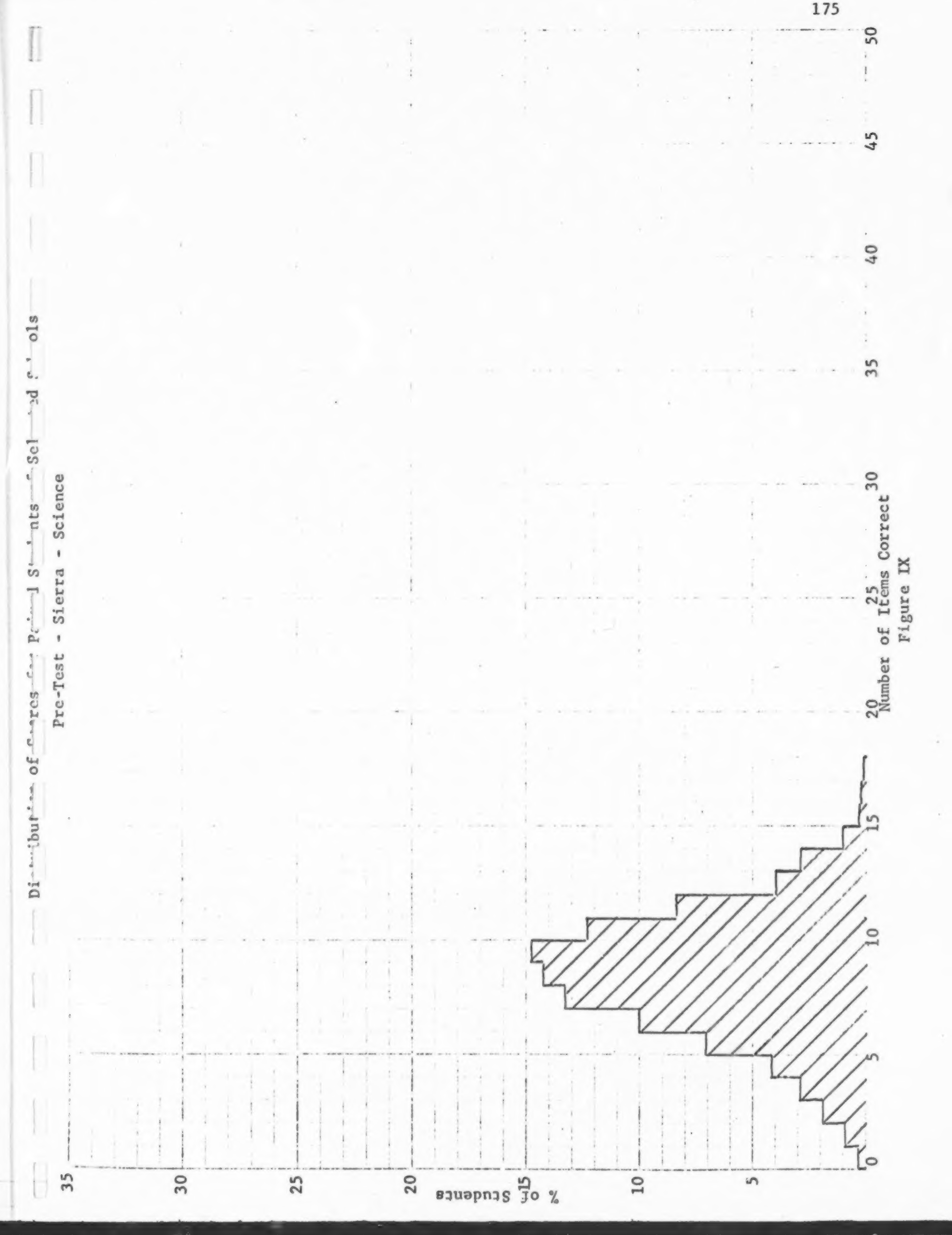


Figure VIII



Distribution of Scores for Paired Students of Selected Schools

Pre-Test - Sierra - Science

Figure IX

Distribution of Scores for Paired Students of Selected Schools

Post-Test - Sierra - Science

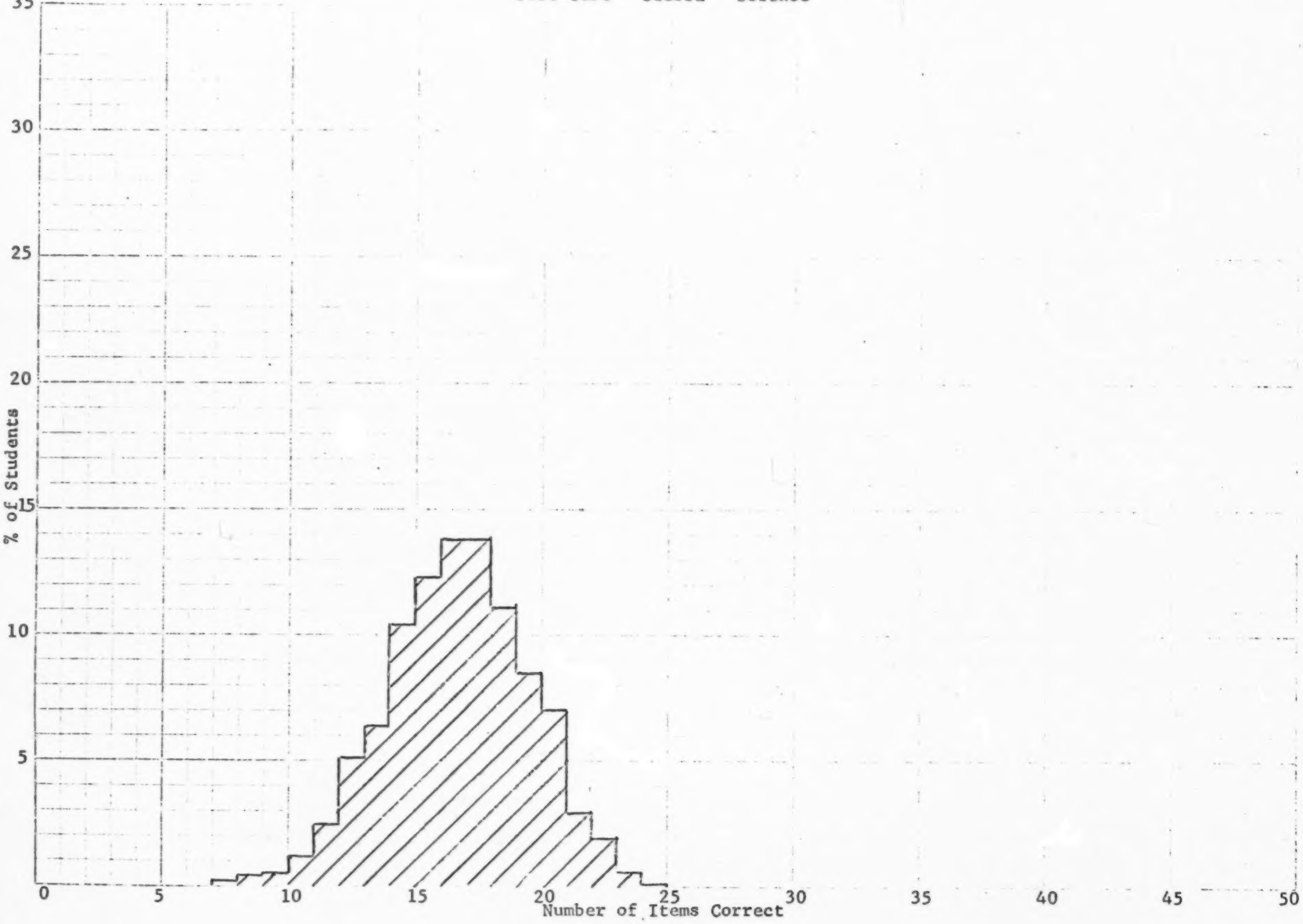


Figure X

Distribution of Scores for Paired Students of Selected Schools:

Pre-Test - Coast - Science

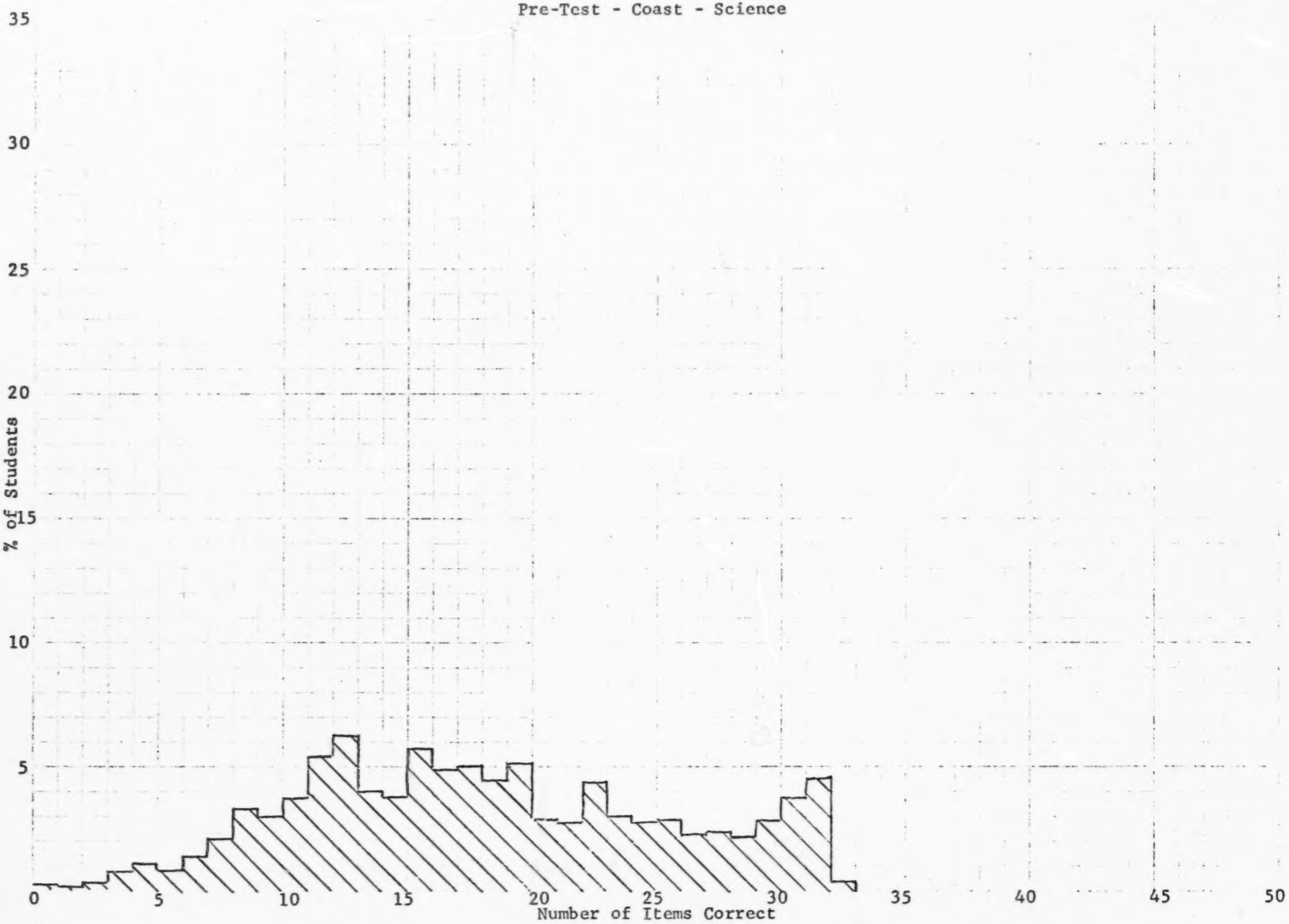


Figure XI

Distribution of Scores for Paired Students of Selected Schools

Post-Test - Coast - Science

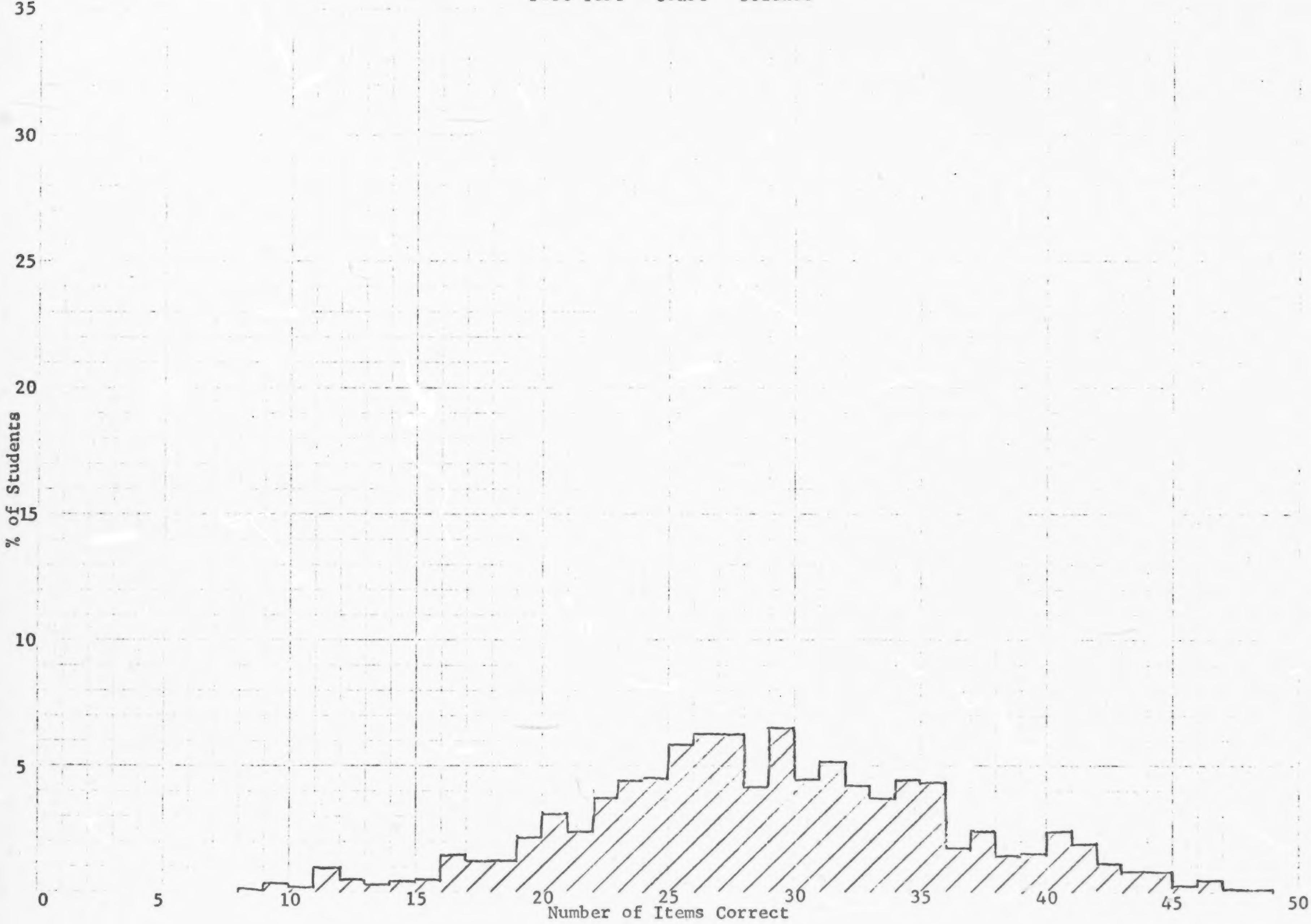


Figure XII

Distribution of Scores for Paired Students of Non-Selected Schools

Pre-test -- Sierra -- Reading

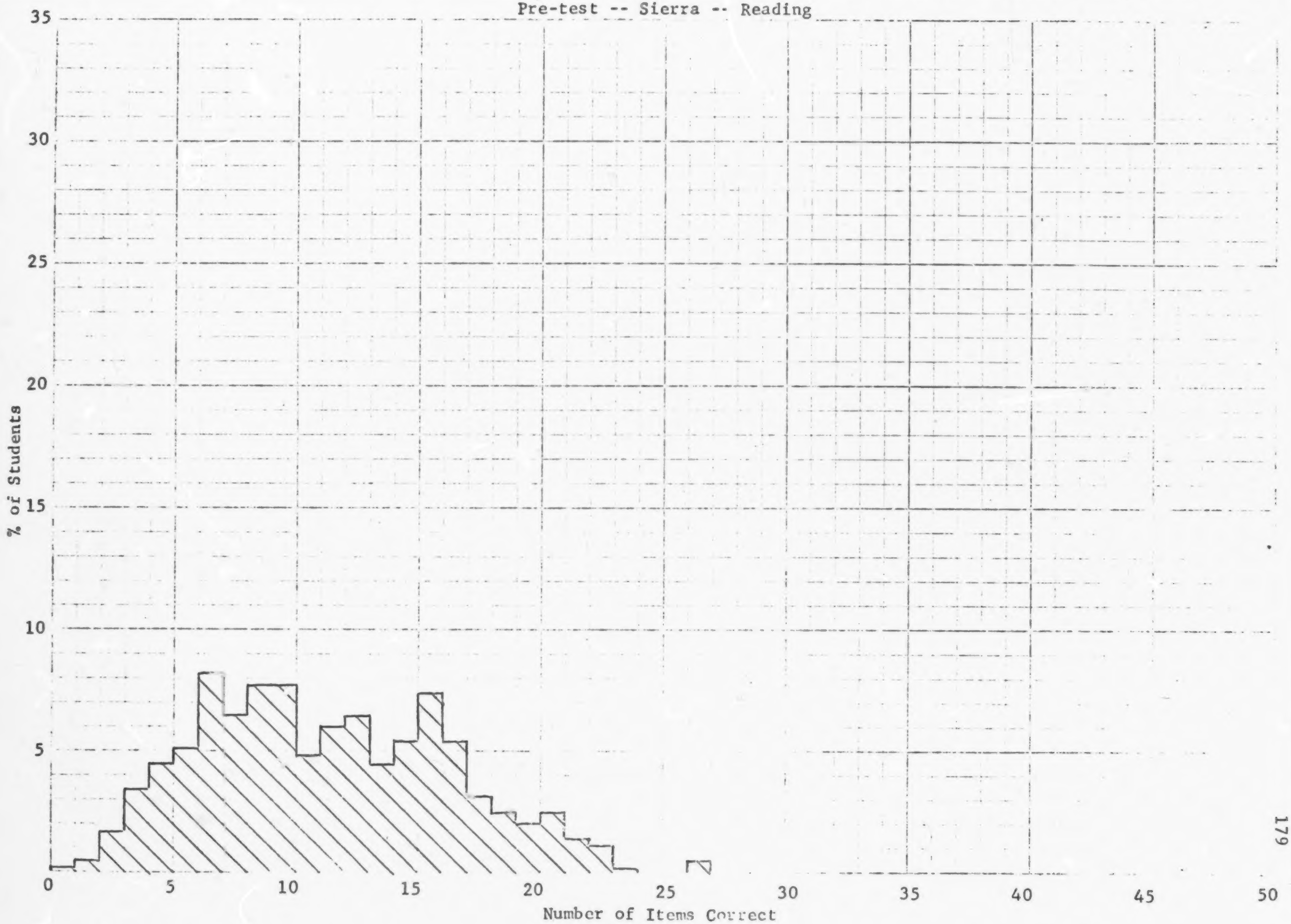


Figure XIII

Distribution of Scores for Paired Students of Non-Selected Schools

Post-test -- Sierra -- Reading

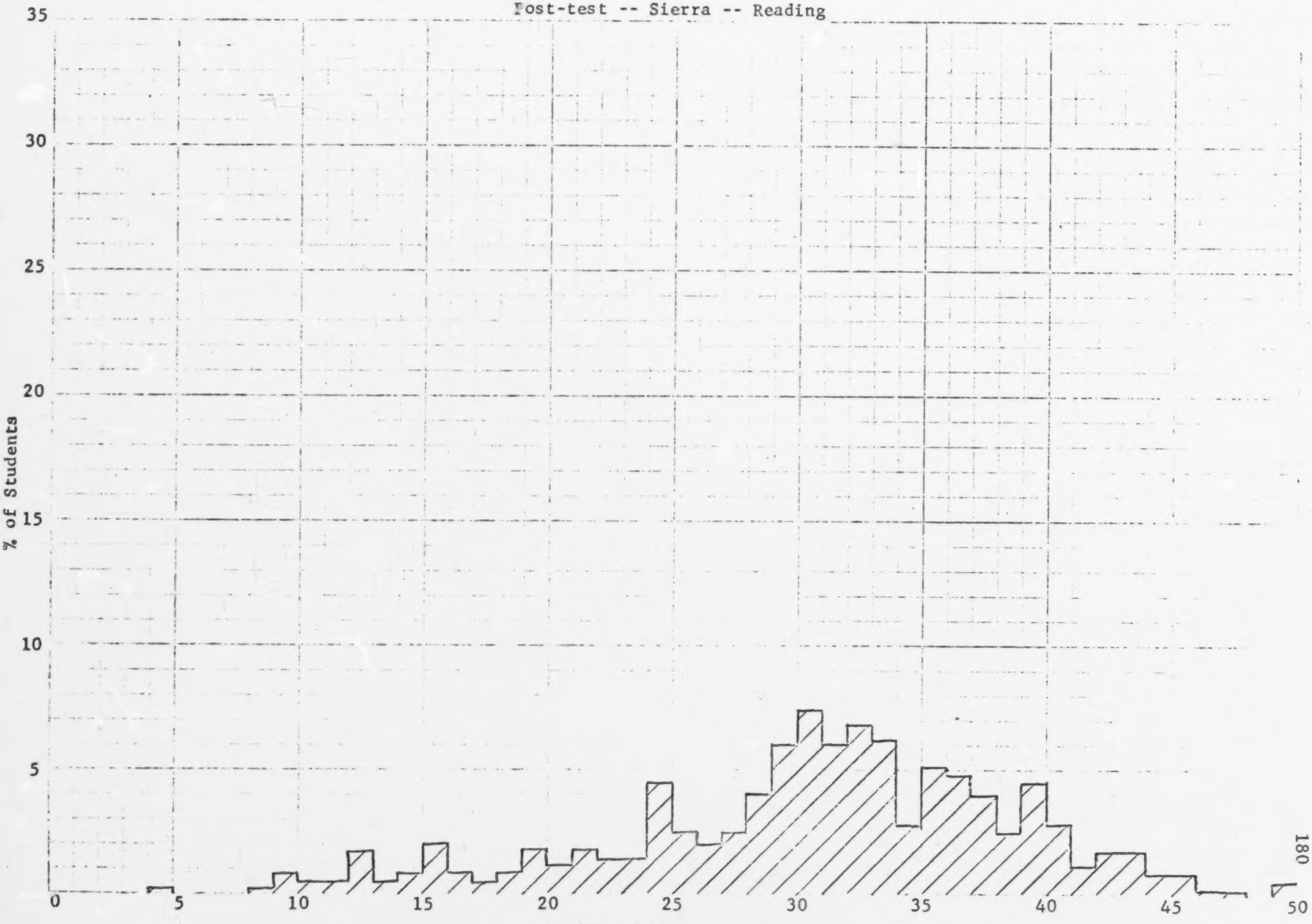
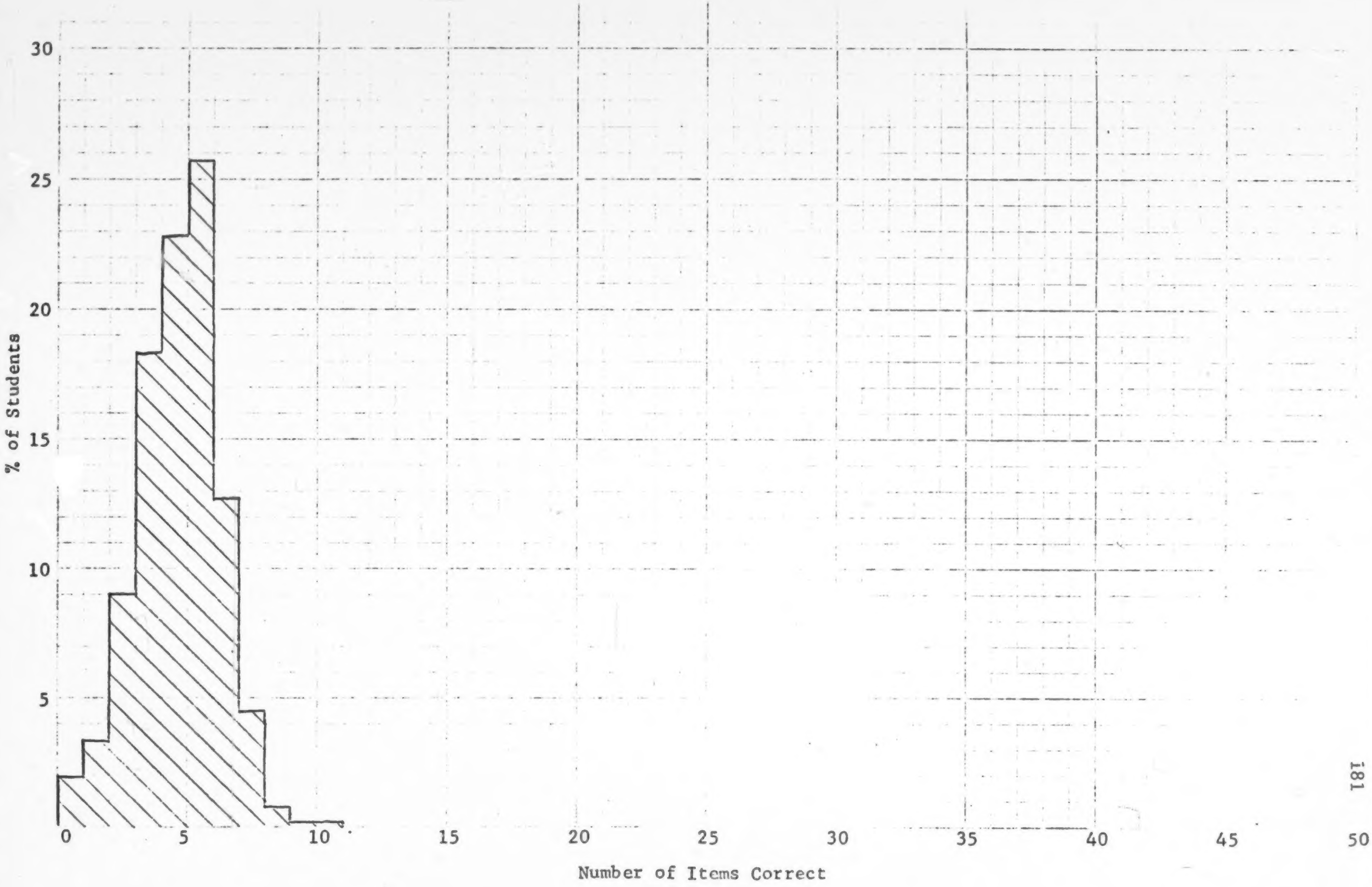


Figure XIV


% of Students
30
25
20
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40
45
50
Number of Items Correct

Figure XV

Distribution of Scores for Paired Students of Non-Selected Schools

Post-test -- Sierra -- Math

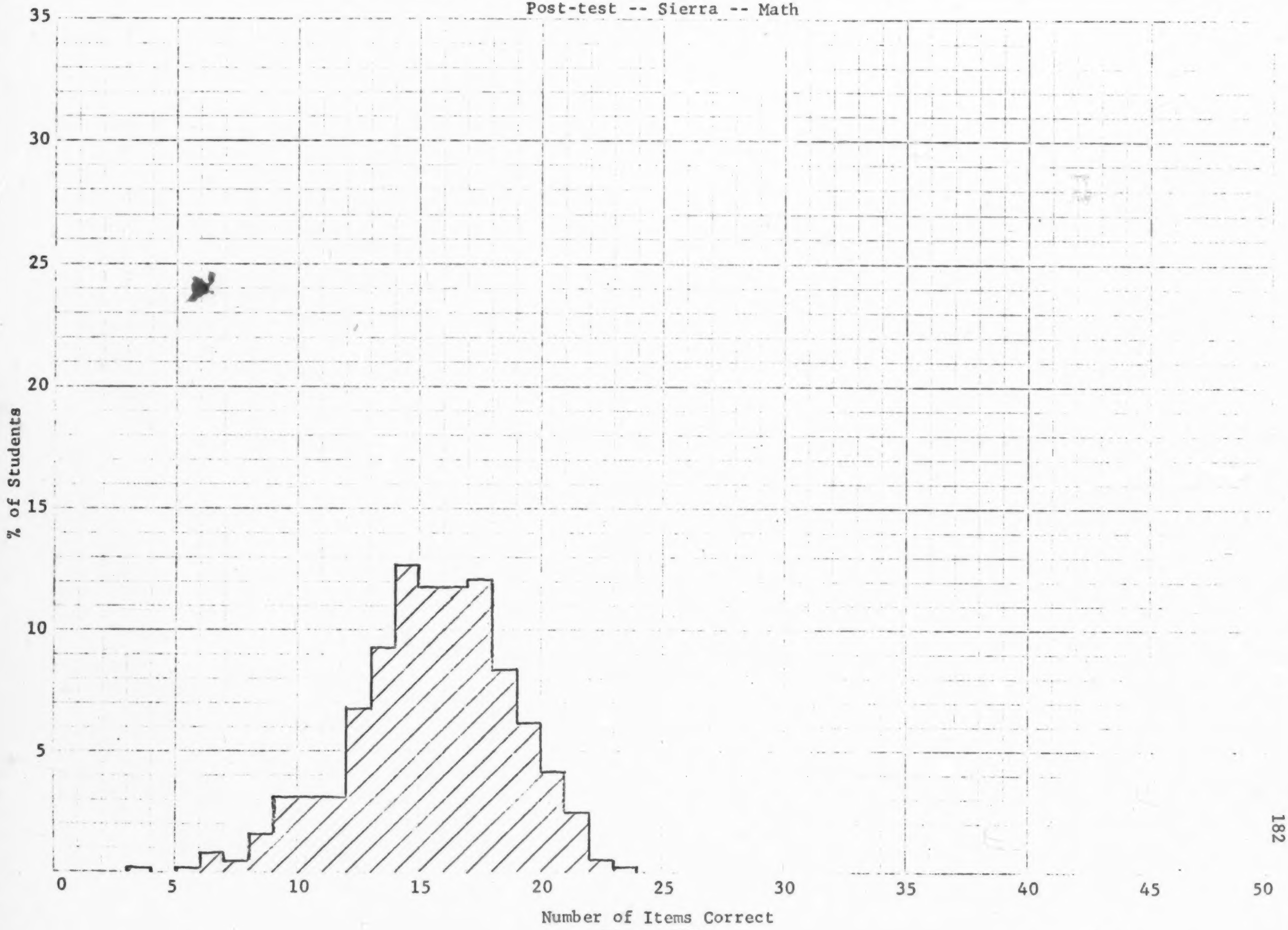


Figure XVI

Distribution of Scores for Paired Students of Non Selected Schools

Pre-test -- Sierra -- Science

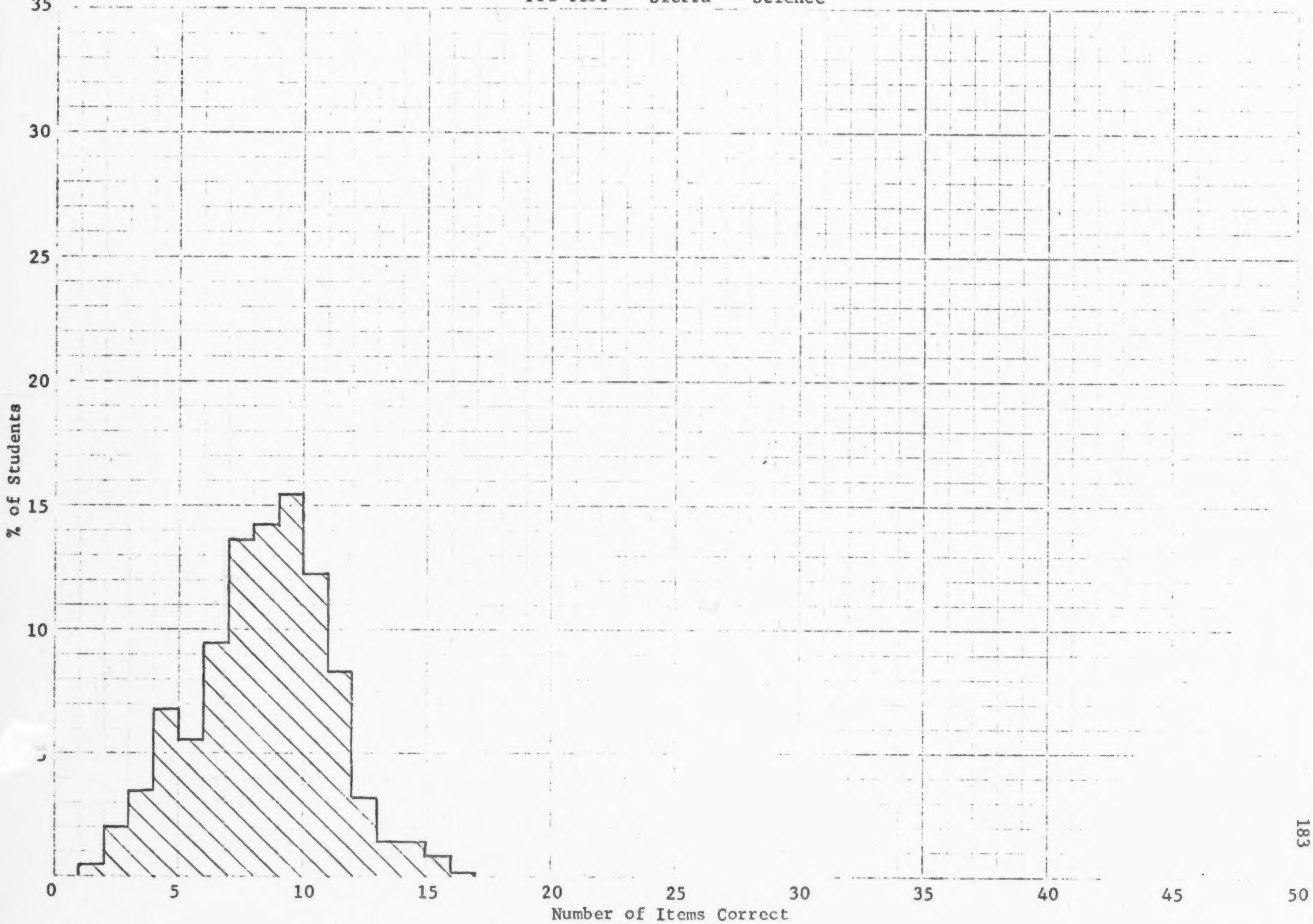


Figure XVII

Distribution of Scores for Paired Students of Non-Selected Schools

Post-test -- Sierra -- Science

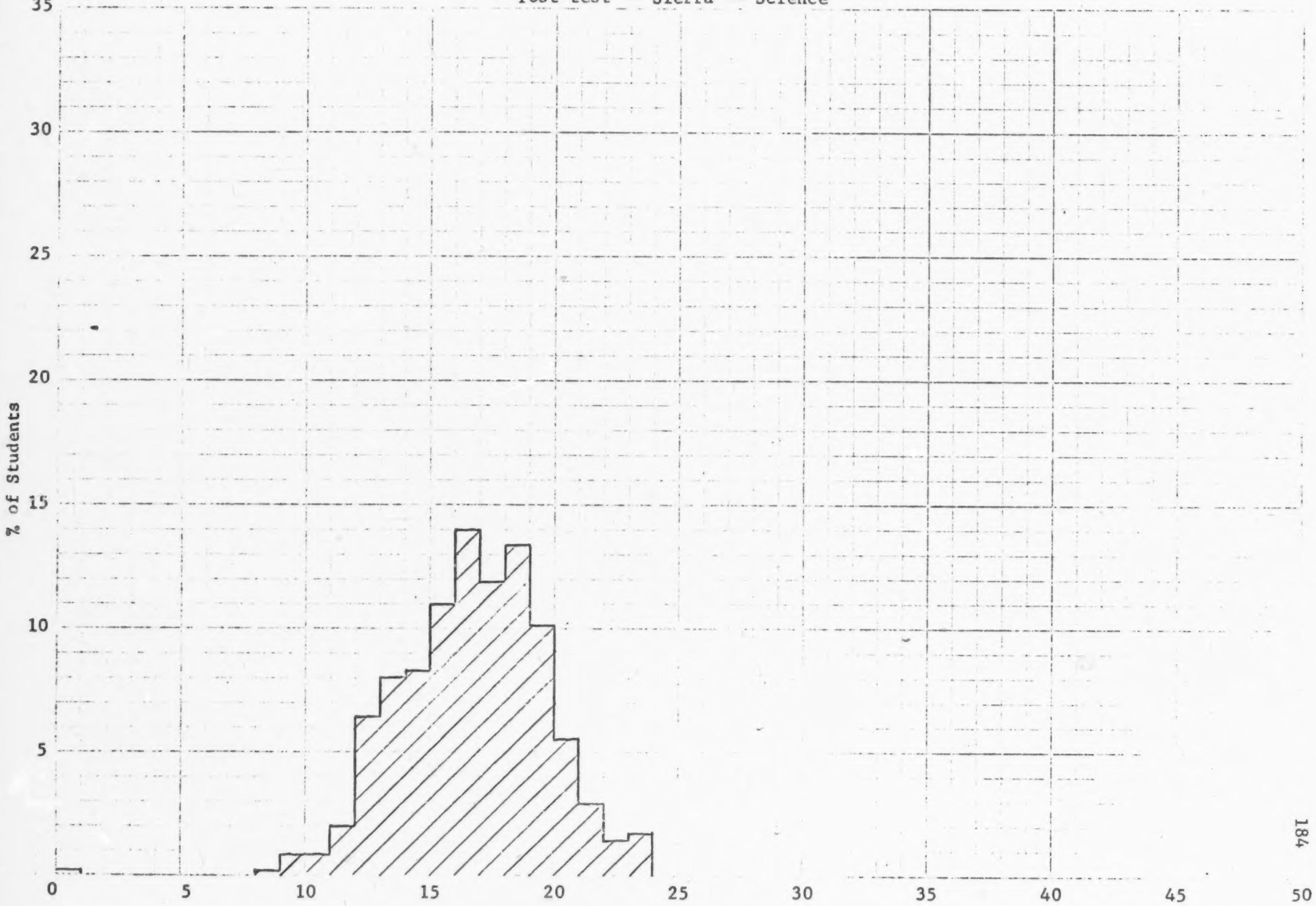


Figure XVIII

Distribution of Scores for Non-Paired Students of Selected School

Pre Test - Sierra - Reading

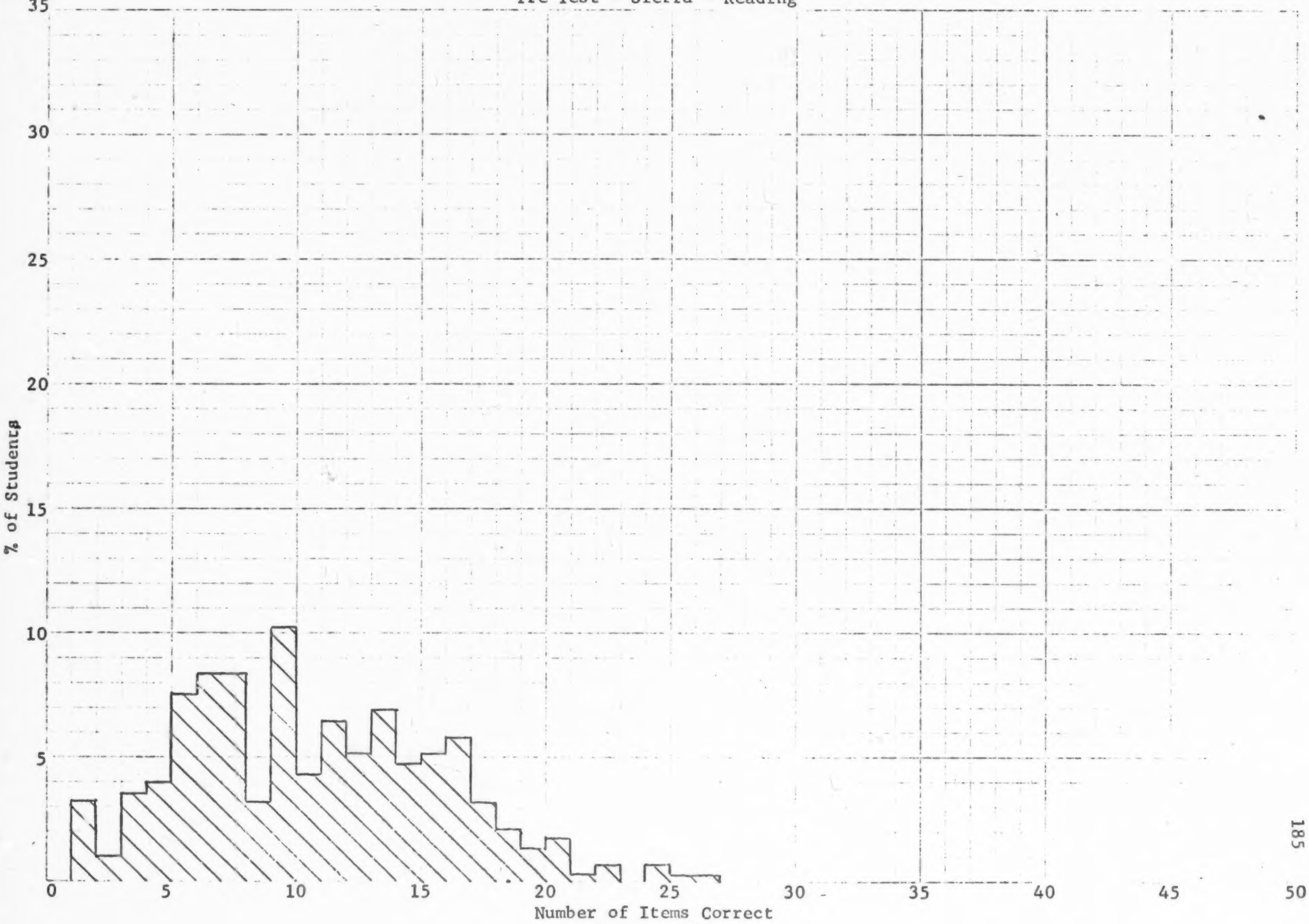


Figure XIX

Distribution of Scores for Non-Paired Students of Selected Schools

Pre Test - Sierra - Math

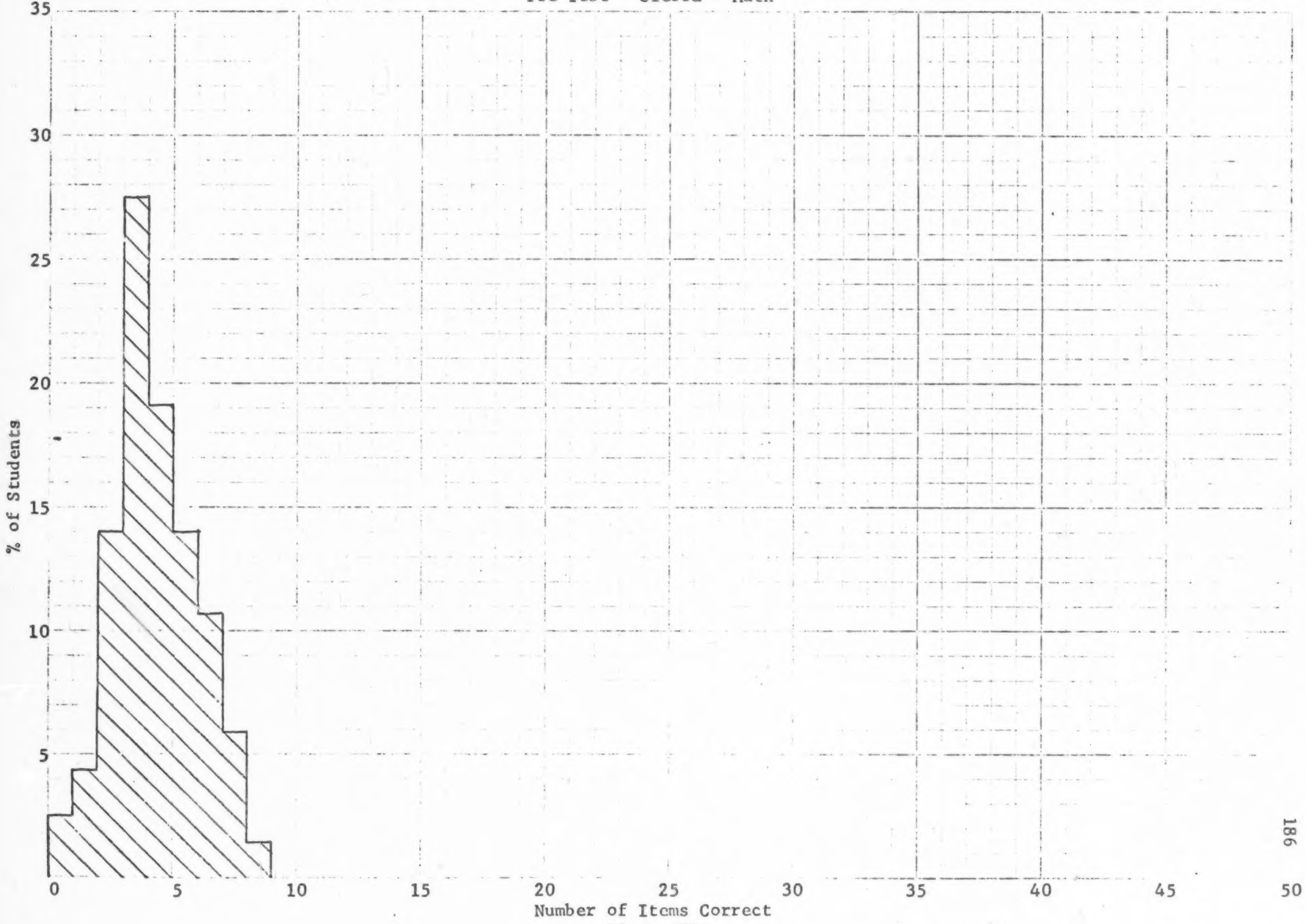
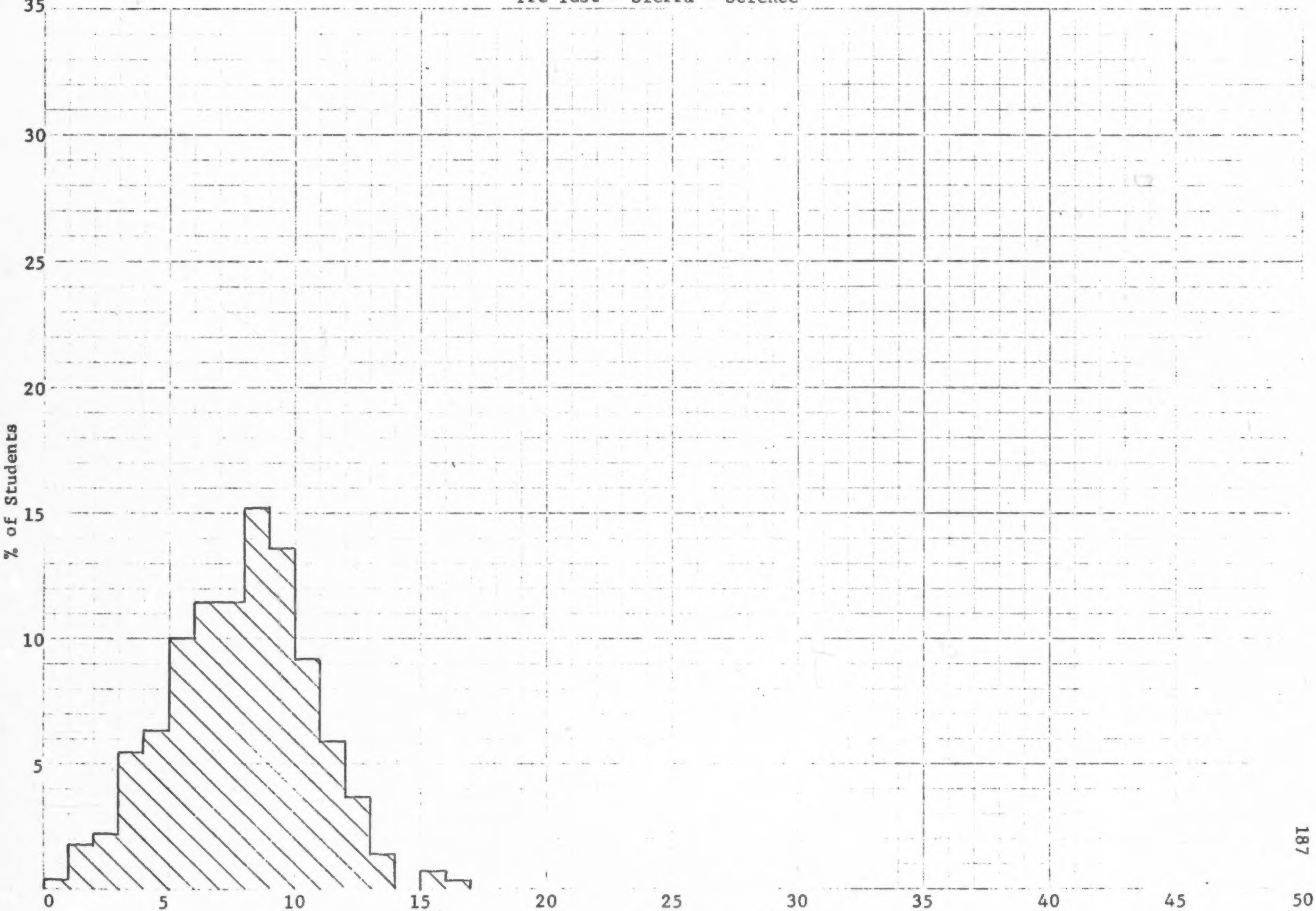


Figure XX

Distribution of Scores for Non-Paired Students of Selected Schools

Pre Test - Sierra - Science



Number of Items Correct

Figure XXI

REPUBLICA DEL ECUADOR
MINISTERIO DE EDUCACION PUBLICA

EVALUACION DE LOS TEXTOS ESCOLARES -GRUPO "B"

No. ________

Forma "A"________

Variable A. ☐
B. ☐
C. ☐

PRUEBA DE LECTURA

Nombre______________________________ Años Escolaridad ________________

Escuela_____________________________ Lugar______________________________

Fecha Aplicación____

Investigador____

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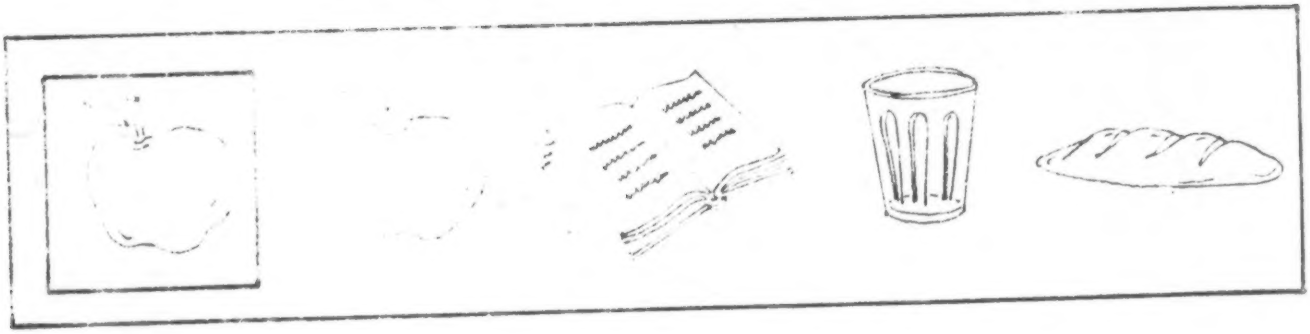
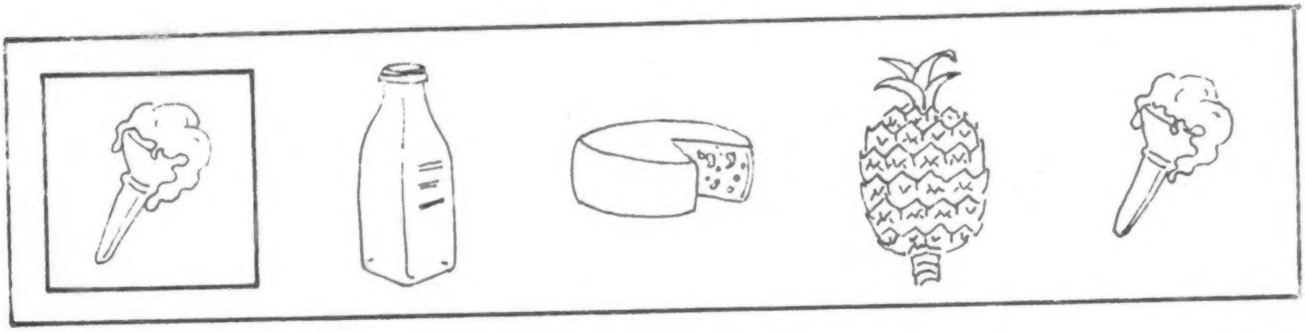
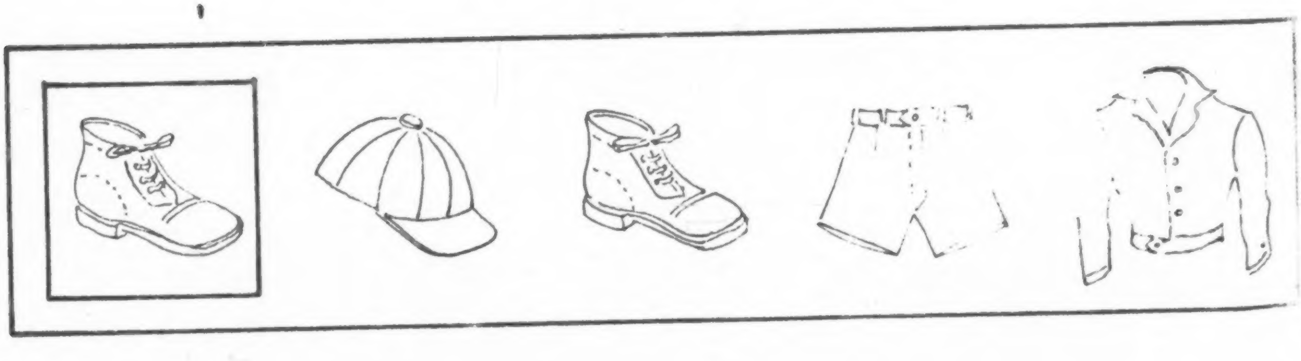
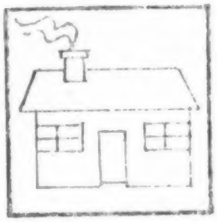
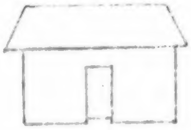
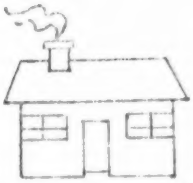
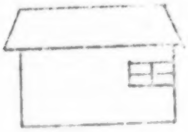
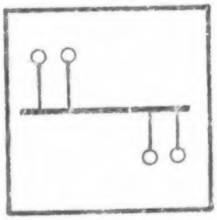
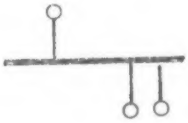
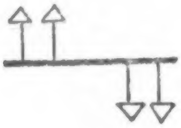
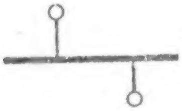
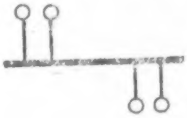


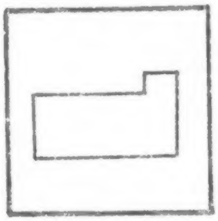
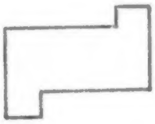
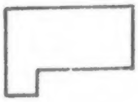
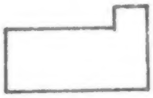
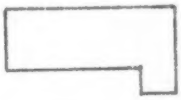




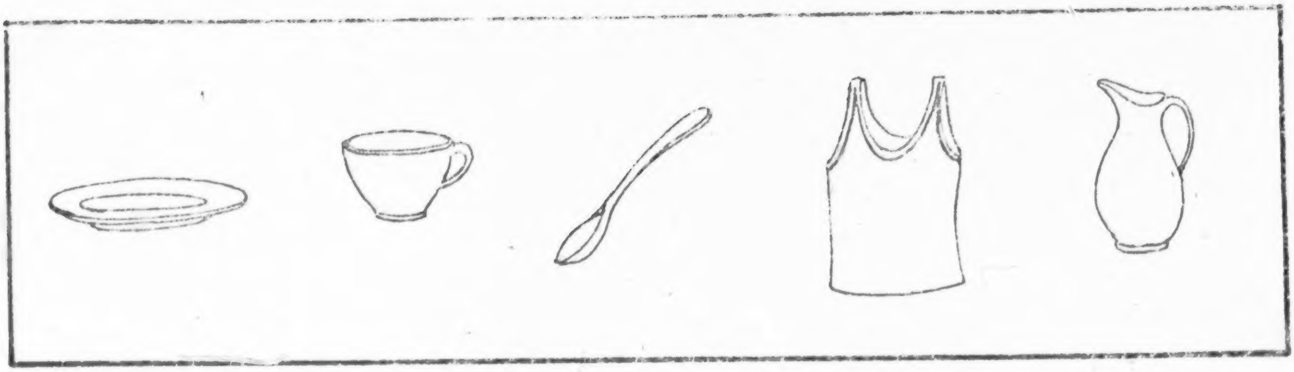


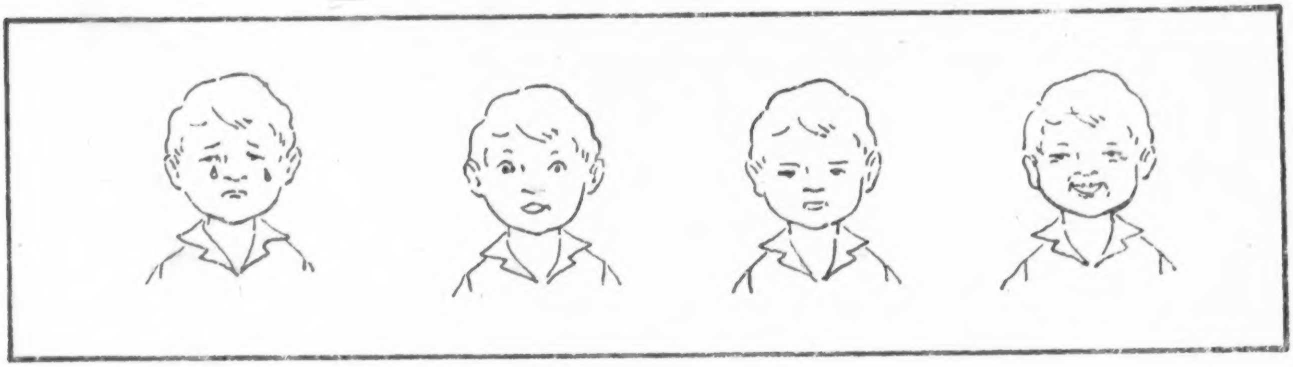






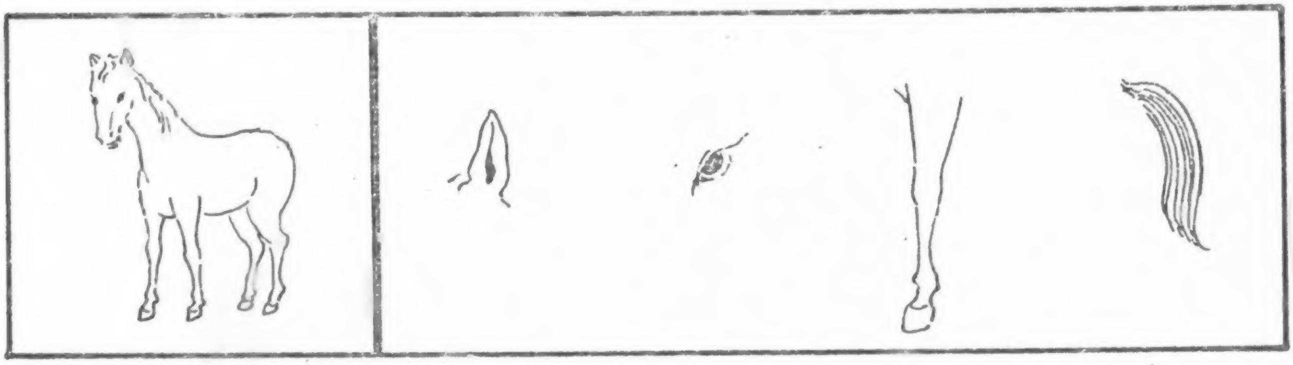






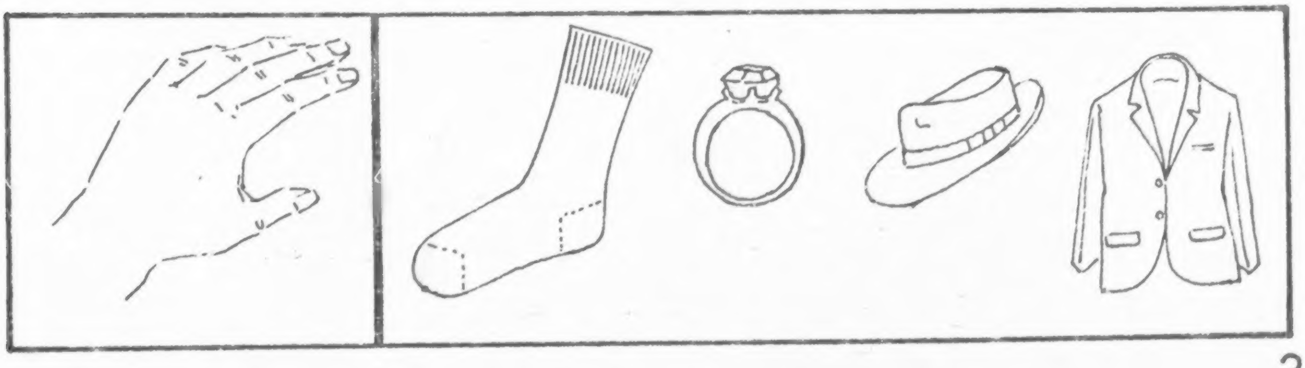
mamá	mesa	mono	mamá	mira

Anita	Adita	Anita	Adela	Amina









carreta carrocería carroza carro

mamadera mamita mamá mas

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florero floristería floripondio flor

libro cuaderno tintero profesor

FLOR flor FLOR FLOR

RAMO RAMO ramo RAMO

conejo conejo conejo conejo

¿Mira? Mira Mira Mira

busca	perro	sube	burro	baja
pila	vuela	pito	brinca	zapato
pájaro	pícaro	papel	página	pasto
mano	mamá	mono	puma	pato

mamá	meta	casa	fama

cabra	cepo	taza	casa

cepo	meta	pelo	jefe

cabra	abrazo	labrador	siembra

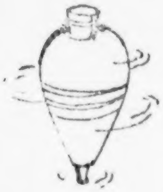
mamá	comí	amor	meta
t	a	m	o

fila	fama	foto	feo
m	i	f	e

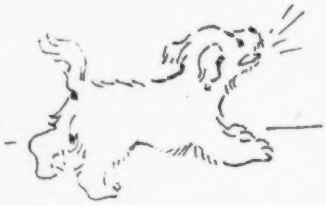
balas	hijos	gradas	pitos
s	a	b	o

colación	lección	asociación	canción
can	cia	ción	lec

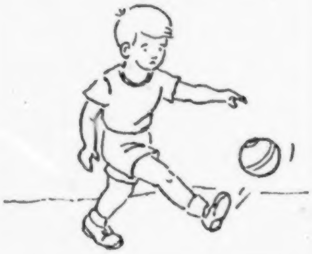
descanso	candado	acantilado	pescando
de	ti	pes	can



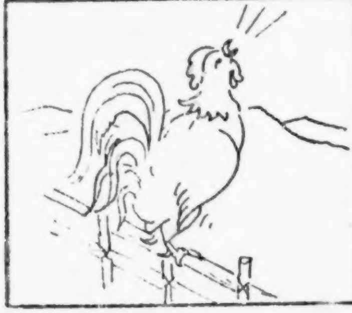
tiza trompo copa sopa



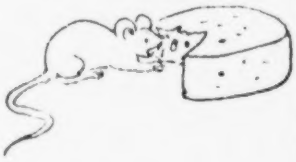
gato zorro toro perro



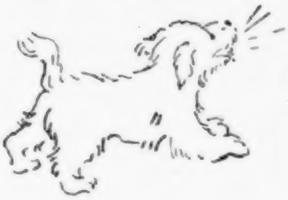
juega baila lee trabaja



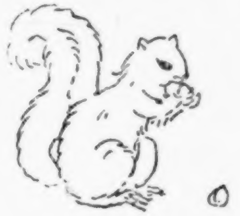
corre canta pelea come



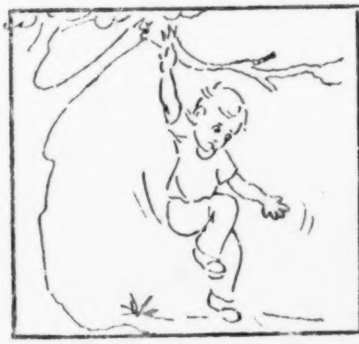
El ratón pelea con el gato.
El ratón come queso.
El ratón cae en la trampa.



Pipo duerme.
Pipo ladra.
Pipo come.



La ardilla está comiendo.
La ardilla es traviesa.
La ardilla tiene ardillitas.



Carlitos sube al árbol.
Carlitos se sienta bajo el árbol.
Carlitos cae del árbol.

El payaso chiquitín
se llamaba Periquín;
y el payaso gigantón
se llamaba Pericón.

payaso	Periquín	gigantón	Pericón

El Picaflor es un pájaro pequeñito.
El picaflor chupa la miel de las flores.
Tiene plumas brillantes.
¡Qué lindo es el picaflor!

plumas	miel	flores	picaflor

Mi potro, dice Juanito, es negro
con una estrella blanca en la frente.
Mi papá lo llama Lucero.
En el campo juega y brinca como
un niño. Cuando él no está,
mi papá lo busca.

Es de Juanito	Es de papá
No tiene dueño	No se de quién es

Mi bandera tiene tres colores
amarillo azul y rojo.
¡Qué hermosa es mi bandera!
Ella representa a la Patria.
Todos los ecuatoriános amamos
nuestra bandera.

bandera

colores

ecuatorianos

Patria

Por la mañana me levanto.
En la noche duermo.
Al mediodía almuerzo.

Hay un nido en el árbol.
La rama se rompe.
Juanito cae y llora.
Juanito sube a cogerlo.

El papá de Lola es pescador.
Todos los días va de pesca al mar.
La niña y su mamá están en casa.
La casa es blanca y tiene flores.

Rosita lava la ....

libreta. ropa. cometa. foto.

Los conejos comen ....

galletas. zanahorias. carne. caramelos.

Los niños ....a la escuela

vas va van ve

Los ....cuidan ovejas

aviadores carpinteros pastores doctores

Los peces

los patos

y las ranas

croan.

nadan.

caminan.

Papá,

mamá y

la abuelita

estudian en primer grado.

comen frutas.

dirige el tránsito.

El médico,

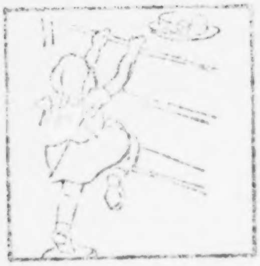
el policía

y la mamá

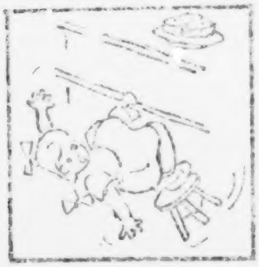
protegen la vida de los niños.

hacen la ropa de los niños

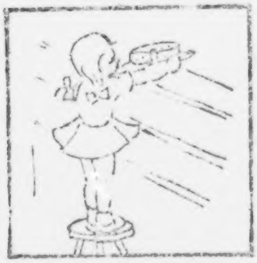
cocinan para los niños.



Mónica quería alcanzar el dulce.



Mónica cayó

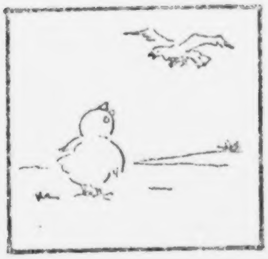


Mónica subió a un banco.

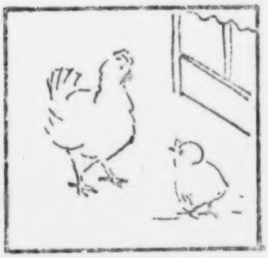
La cometa se enredó en un árbol.

Diego hacía volar su cometa.

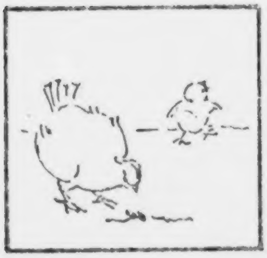
Diego subió al árbol y bajó su cometa.



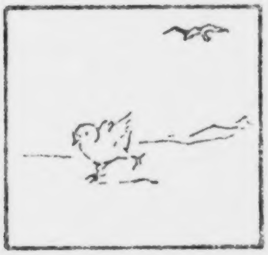
Se encontró con un hambriento
gavilán.



Llegó a casa y pidió perdón
a su mamá.



Un pollito desobediente
se alejó de su mamá.



El pollito, asustado,
corrió y corrió.

REPUBLICA DEL ECUADOR
MINISTERIO DE EDUCACION PUBLICA

EVALUACION DE LOS TEXTOS ESCOLARES, GRUPO "B"

No. ____________

Forma "B" ____________

Variable
A. ☐
B. ☐
C. ☐

PRUEBA DE LECTURA

Nombre ____________ Años Escolaridad ____________

Escuela ____________ Lugar ____________

Fecha Aplicación ____________

Investigador ____________

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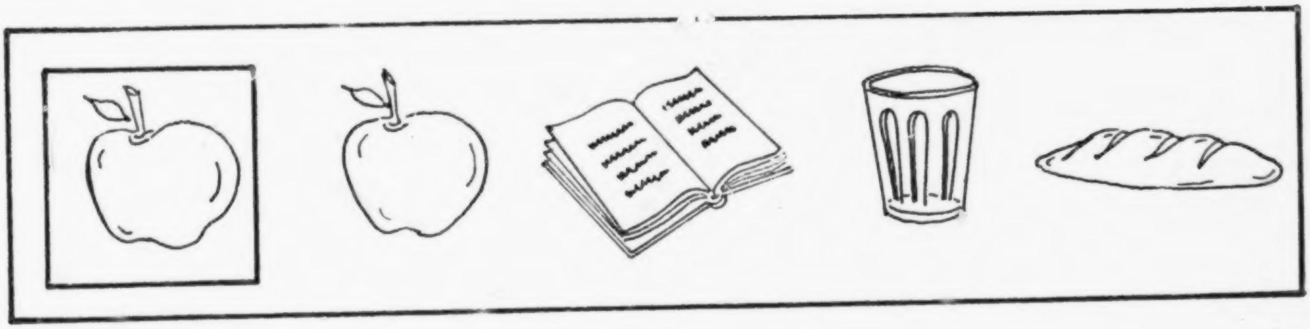
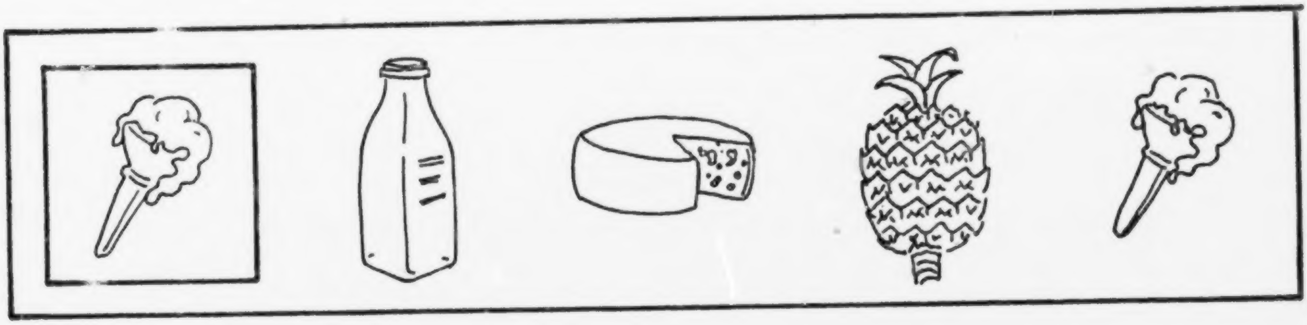
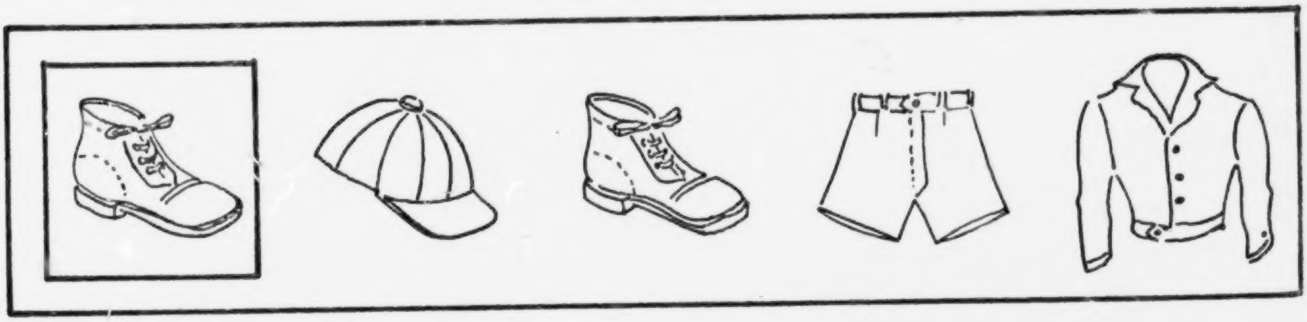
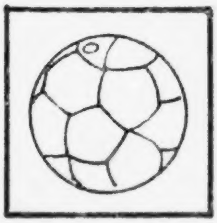
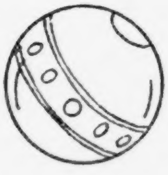
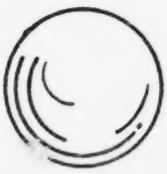
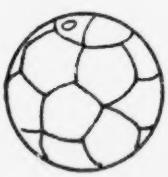
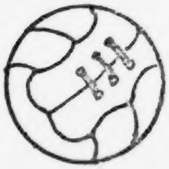
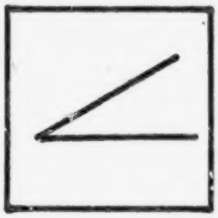
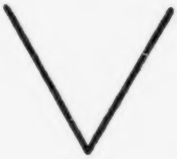
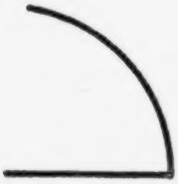
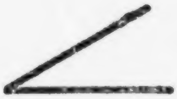


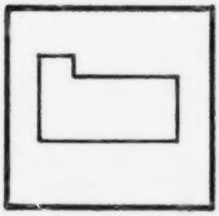
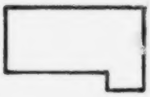
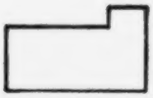
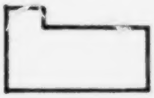
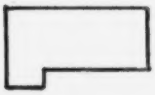




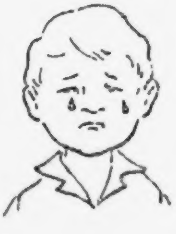
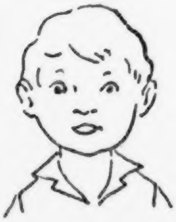
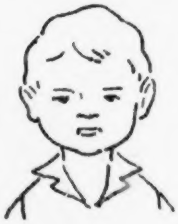
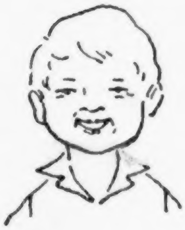


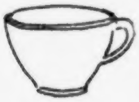
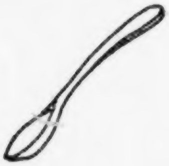
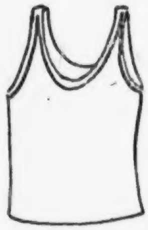
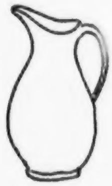




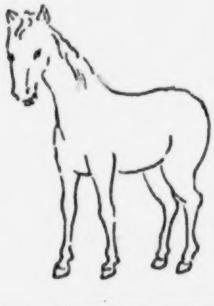
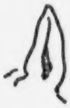
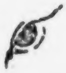
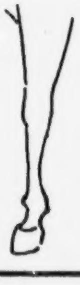
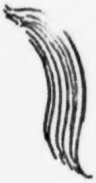






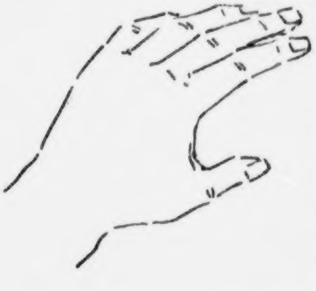
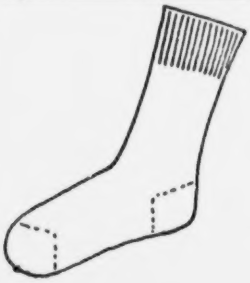
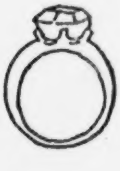
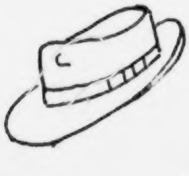
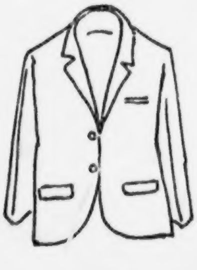
mamá	mesa	mono	mamá	mira

sal	col	sol	cal	sal

esferográfico
escritorio
macetero
puntero

gallo
gallina
gallinero
gallito

libro
cuaderno
tintero
profesor

carnicero
pelota
mesa
abuelita

FLOR flor FLOR FLOR

MORA MORA mora MORA

conejo conejo conejo conejo

Salta ¡Salta! Salta Salta

busca perro sube burro baja

pito vuela pila brinca zapato

Pepito Lolita Anita José Copito

mano mamá mono puma pato

pelo papá cepo puso

casa cabra cepo taza

fila fama foto feo

cabra abrazo labrador siembra

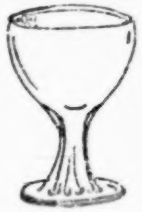
mamá	meta	fama	comí
a	m	o	t

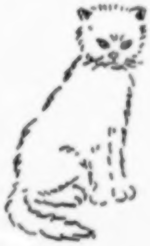
fila	fama	foto	feo
m	i	f	e

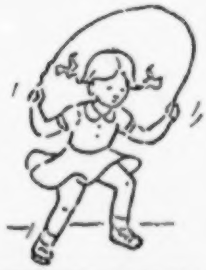
balas	hijos	gradas	pitos
s	a	b	o

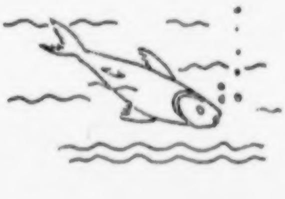
colación	lección	asociación	canción
can	cia	ción	lec

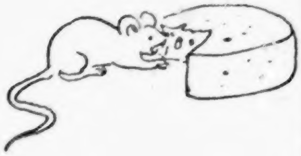
descanso	candado	acantilado	pescando
de	ti	pes	can

	sapo	silla	copa	árbol

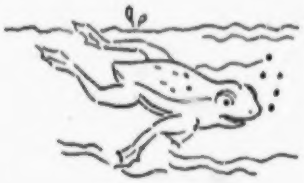
	gato	pollo	mesa	casa

	llora	cocina	salta	cose

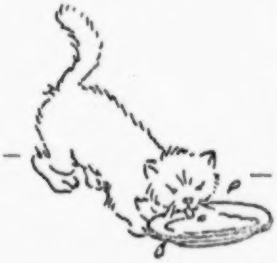
	nada	camina	vuela	trota



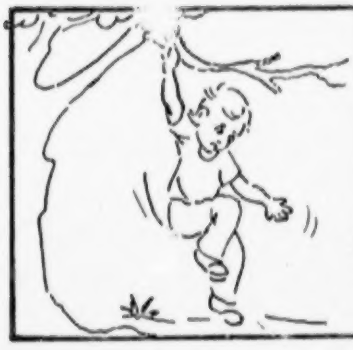
El ratón pelea con el gato.
El ratón come queso.
El ratón cae en la trampa.



La rana croa.
La rana nada.
La rana come.



El gato toma leche.
El gato juega con la pelota.
El gato sigue al ratón.



Carlitos sube al árbol.
Carlitos se sienta bajo el árbol.
Carlitos cae del árbol.

El payaso chiquitín
se llamaba Periquín;
y el payaso gigantón
se llamaba Pericón.

payaso	Periquín	gigantón	Pericón

Tengo una hermosa gallina.
Mi gallina puso un huevo.
Mi gallina come hormigas.
Mi gallina está en el huerto.

huevo	gallina	hormigas	huerto

Mi potro, dice Juanito, es negro
con una estrella blanca en la frente.
Mi papá lo llama Lucero.
En el campo juega y brinca como
un niño. Cuando él no está,
mi papá lo busca.

Es de Juanito.	Es de papá.
No tiene dueño.	No se de quién es.

Los niños van al circo.
En el circo hay animales y enanos.
También hay un payaso con
careta roja.
El payaso se para de cabeza.
El payaso hace chistes.
Los niños gozan con el payaso.

enanos	animales	payaso	niños

Por la mañana me levanto.

En la noche duermo.

Al mediodía almuerzo.

El pescador va al mar.

Recoge muchos peces.

¡Qué buena estuvo la pesca!

Tiende las redes.

El papá de Lola es pescador.

Todos los días va de pesca al mar.

La niña y su mamá están en casa.

La casa es blanca y tiene flores.

Rosita lava la ....

libreta. ropa. cometa. foto.

Las palmeras nos dan ....

piñas. pepinos. café. cocos.

Los niños ....a la escuela

vas va van ve

Los.................son para los pies

sombreros camisas guantes zapatos

Los peces

los patos croan. nadan. caminan.

y las ranas

Papá, estudian en primer grado.

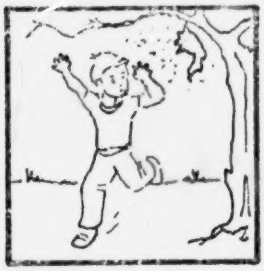
mamá y comen frutas.

la abuelita dirigen el tránsito.

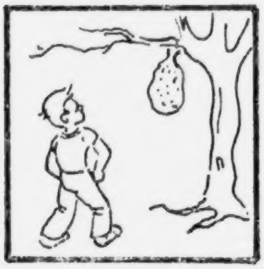
El médico, protegen la vida de los niños.

el policía hacen la ropa de los niños

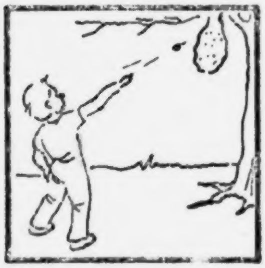
y la mamá cocinan para los niños.



Las avispas picaron a Pepito.



Pepito vio un avispero.

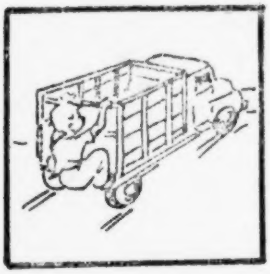


Lanzó una piedra al avispero.

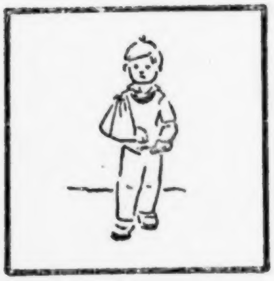
Hay un nido en el árbol.

Juanito cae y llora.

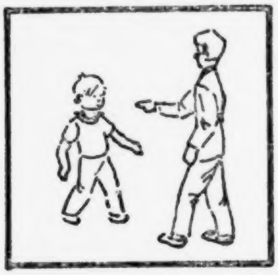
Juanito sube a cogerlo.



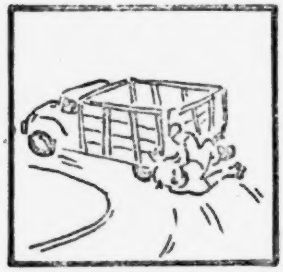
Juanito desobediente vió
un camión y se colgó.



Ahora Juanito tiene un brazo roto.



Papá dijo a Juanito: no te
cuelgues de los carros.



Al curvar el camión, el niño cayó.

REPUBLICA DEL ECUADOR
MINISTERIO DE EDUCACION PUBLICA

EVALUACION DE LOS TEXTOS ESCOLARES -GRUPO "B"

No. ______

Forma "A"______

Variable A. ☐
B. ☐
C. ☐

PRUEBA DE MATEMATICAS

Nombre______________________ Años Escolaridad ____________

Escuela______________________ Lugar______________________

Fecha Aplicación______________________________________

Investigador____

Prohibida la Reproducción-Derechos reservados Ministerio de Educación

PRUEBA ____

FORMA ____

APLICACION ____

ESCUELA ____

PRIMER GRADO ____

PROVINCIA ____

CANTON ____

PARROQUIA ____

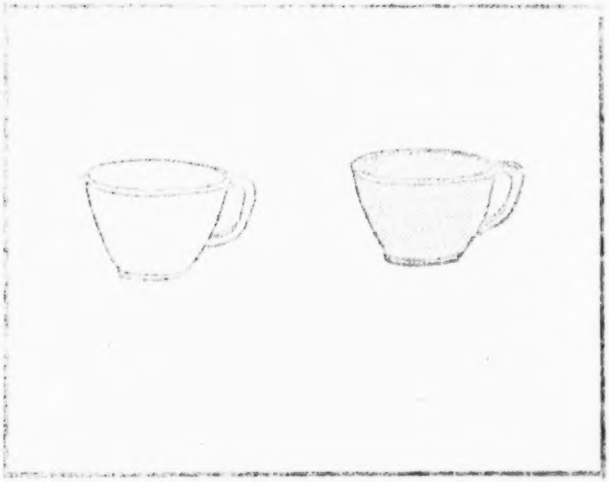
PROFESOR ____

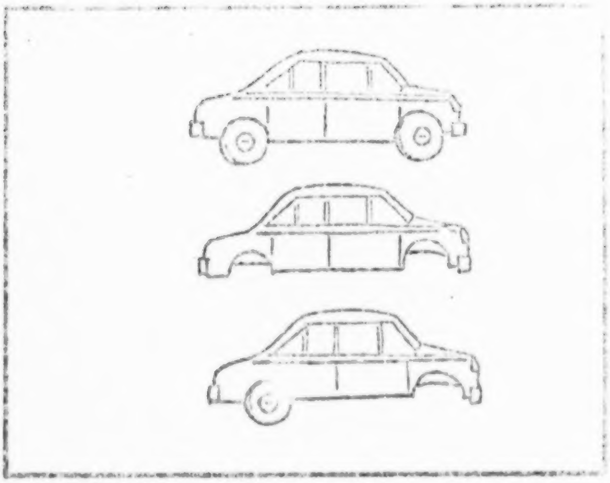
SUPERVISOR ____

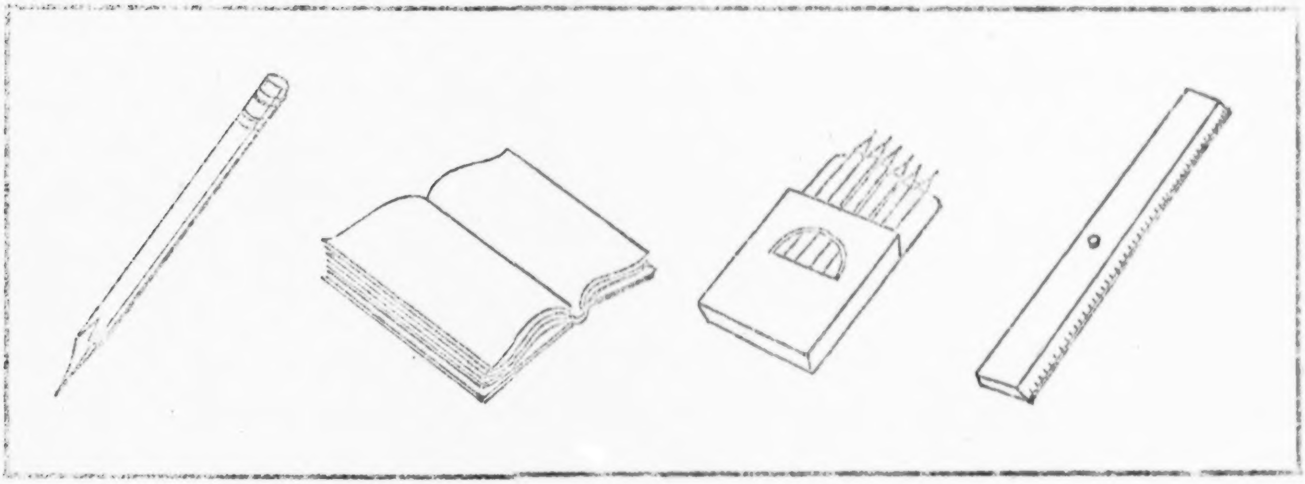
INVESTIGADOR ____

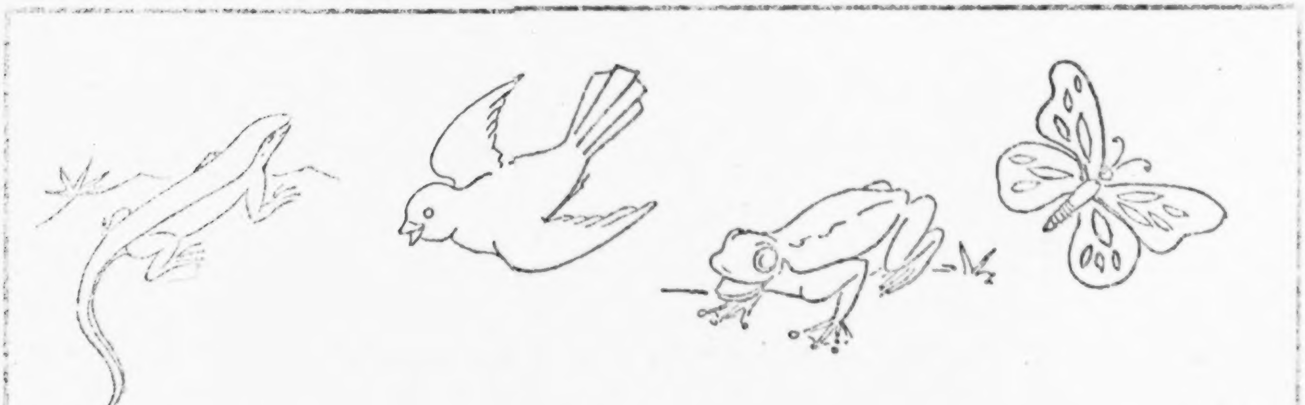
FECHA ____

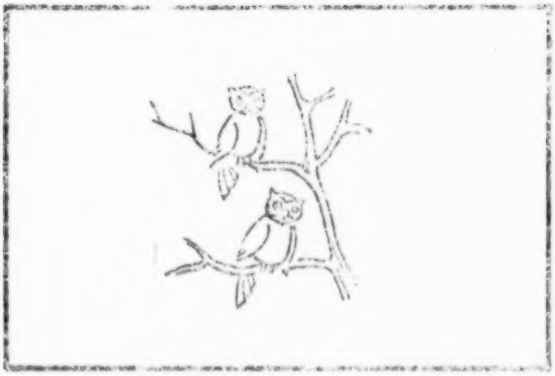
QUITO-ECUADOR

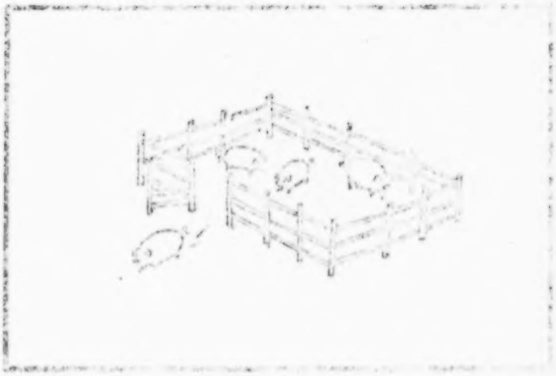


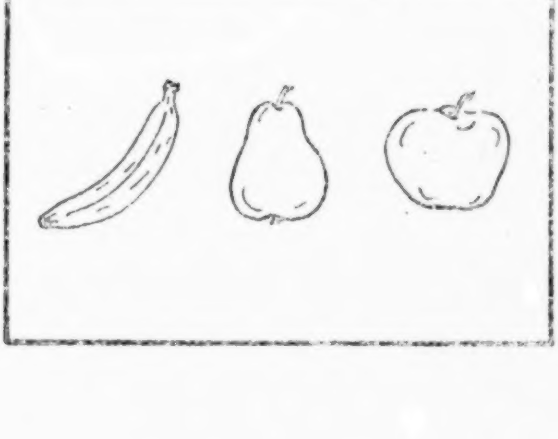


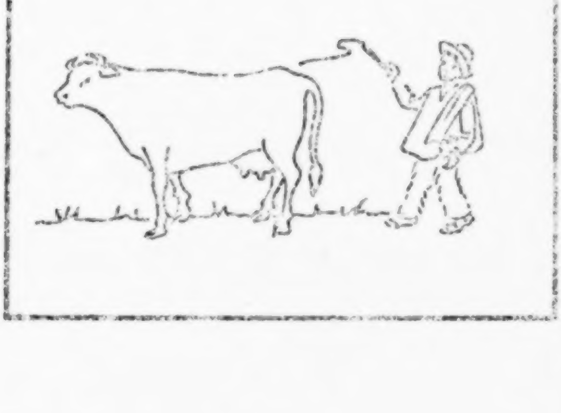


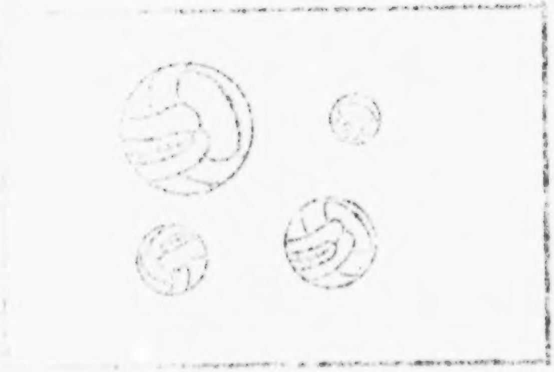


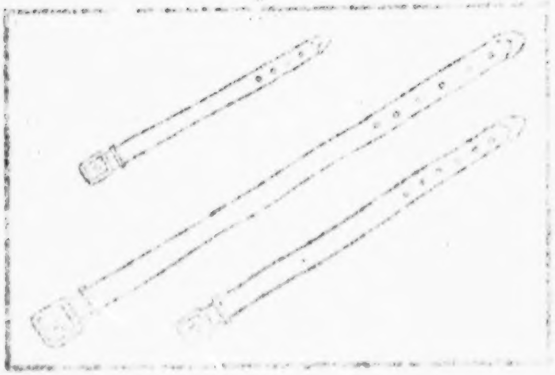


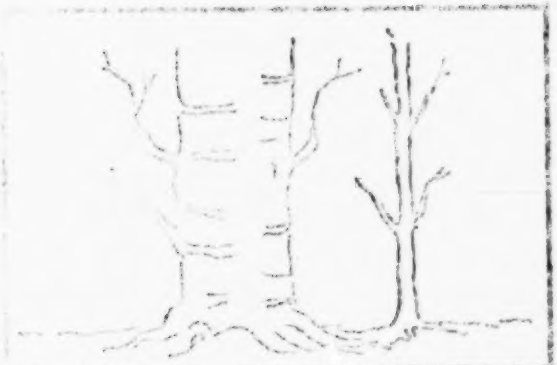


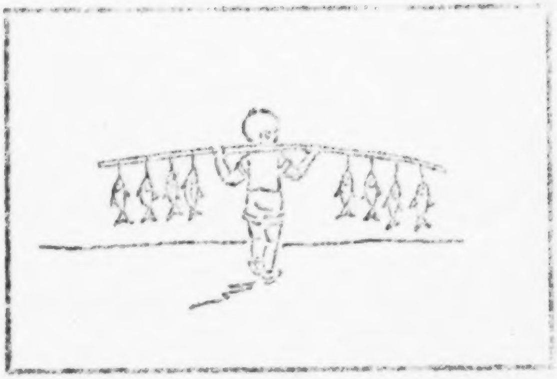


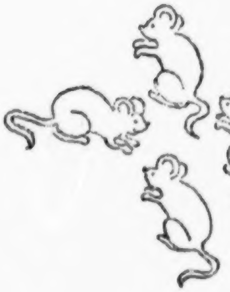


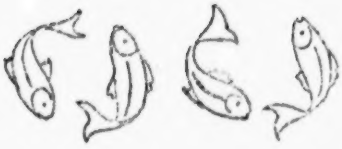


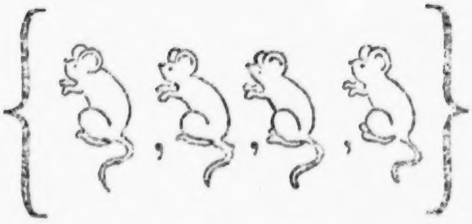


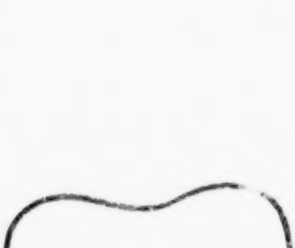


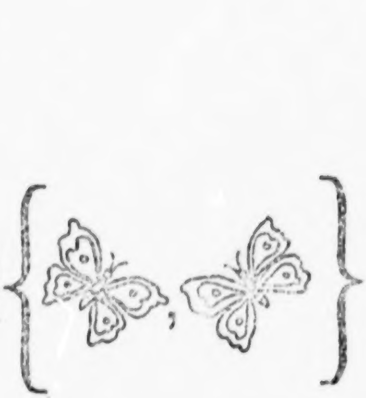


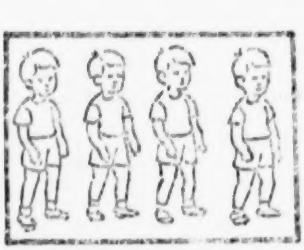


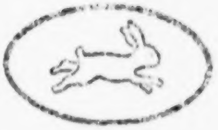


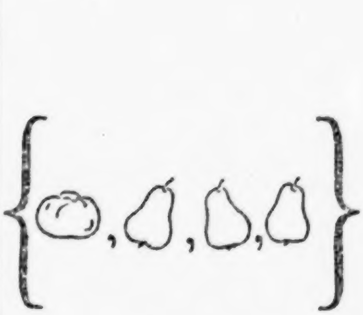


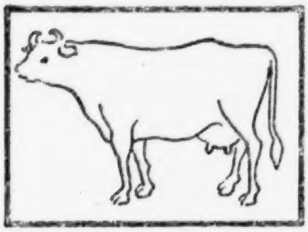


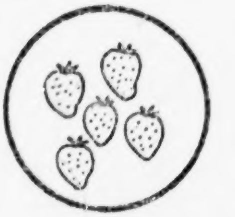


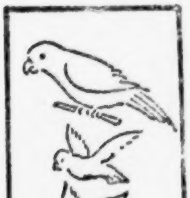


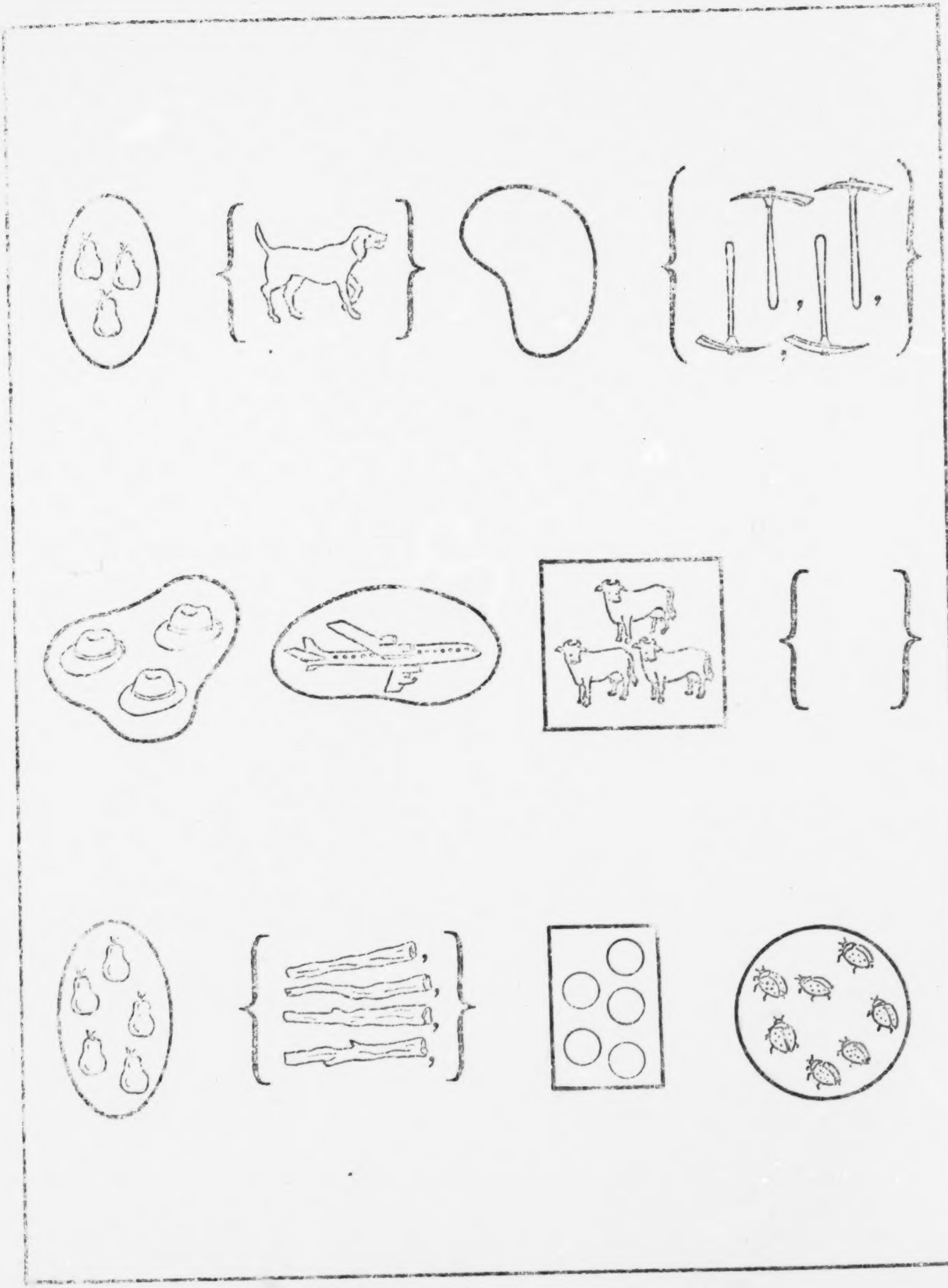












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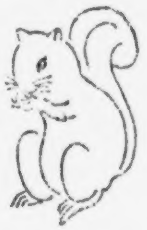

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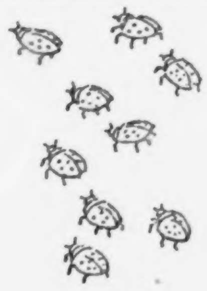

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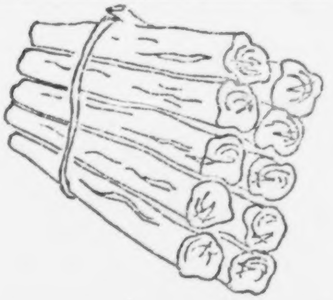
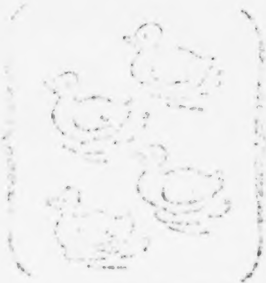


5	2	10



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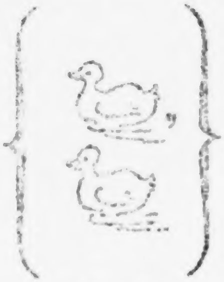

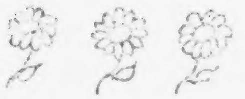

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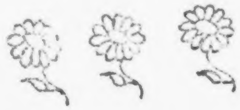

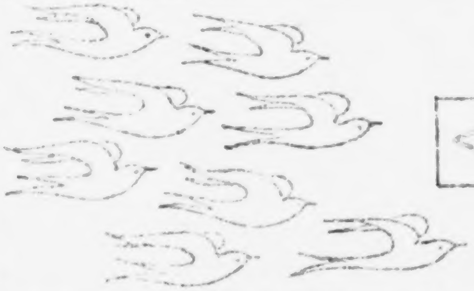

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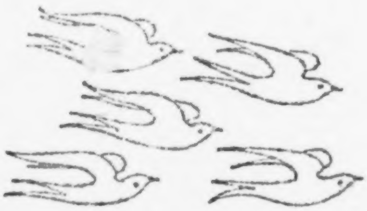
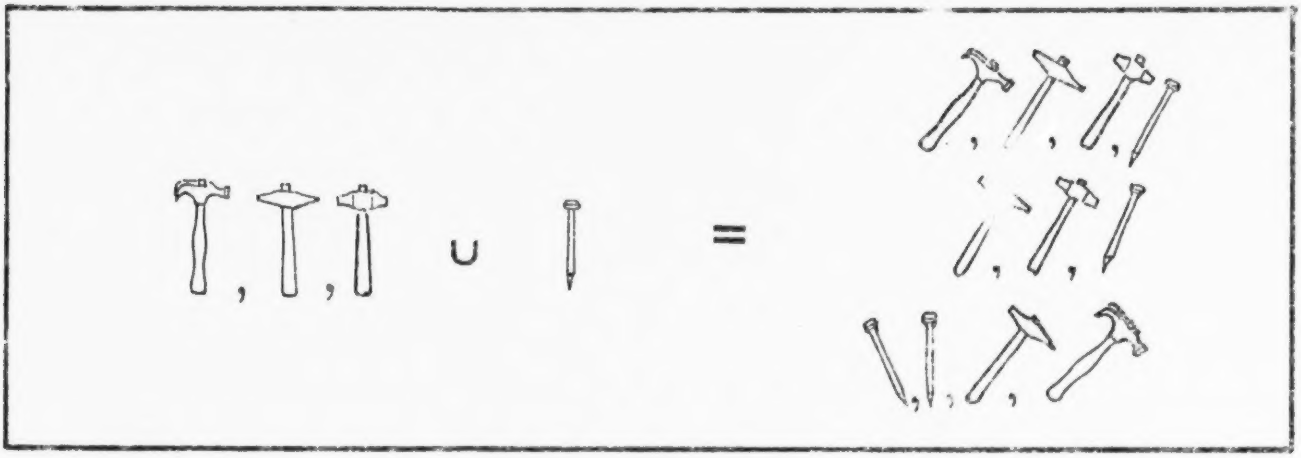
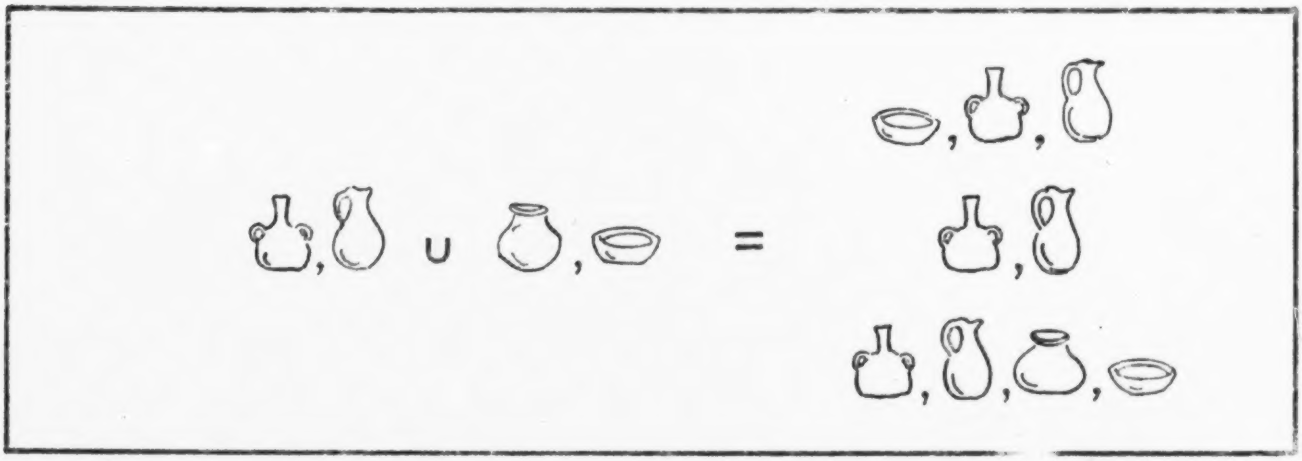


$0\ \boxed{>}\ \boxed{=}\ \boxed{<}\ 6$





$$\begin{array}{r} 3 \\ +\ 6 \\ \hline \end{array}$$

$\boxed{9}\quad\boxed{5}\quad\boxed{10}$

$$\begin{array}{r} 2 \\ +\ 0 \\ \hline \end{array}$$

$\boxed{0}\quad\boxed{2}\quad\boxed{4}$

$$\begin{array}{r} 8 \\ -\ 0 \\ \hline \end{array}$$

$\boxed{0}\quad\boxed{8}\quad\boxed{7}$

$$\begin{array}{r} 18 \\ -\ 4 \\ \hline \end{array}$$

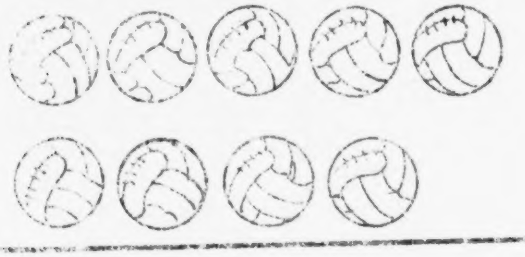
$\boxed{15}\quad\boxed{14}\quad\boxed{12}$

$6 + \boxed{1}\quad\boxed{0}\quad\boxed{2} = 8$

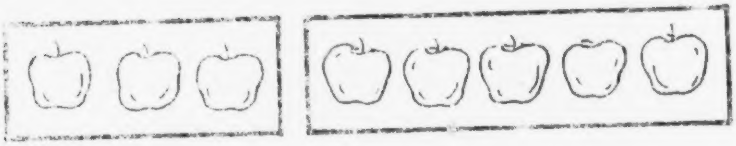
$\boxed{4}\quad\boxed{3}\quad\boxed{2} + 4 = 7$

$24 = 10 + 10 + \cdots\cdots\quad\boxed{4}\quad\boxed{3}\quad\boxed{5}$

$20 + (30 + 30) = \boxed{80}\quad\boxed{60}\quad\boxed{50}$



$\boxed{3}$ $\boxed{1}$ $\boxed{2}$



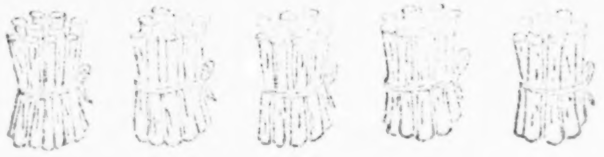
$\boxed{2}$ $\boxed{5}$ $\boxed{1}$

$\{○, △, □, ◇\}$ $\{○\ △\}$

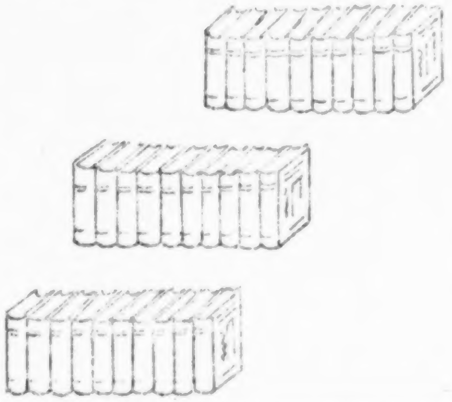
$\{○, □, ◇\}$

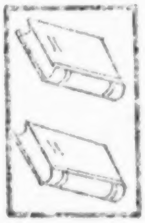
$\{△, □, △\}$

$\{□, ◇\}$



60	50	5	50





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2	22	32	42

1	2	3		5	6	7	8	9	10

1	4	10

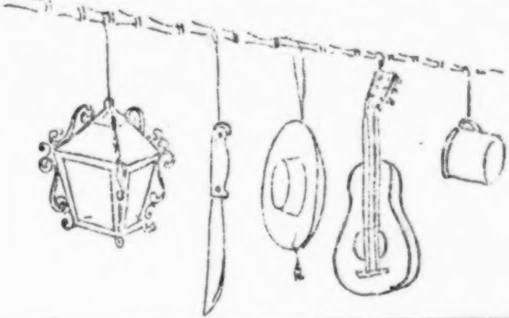
2	4	6		10	12	14	16	18	20

8	7	9

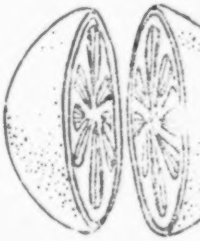
5	10	15	20	25	30	35		45	50

1	40	24

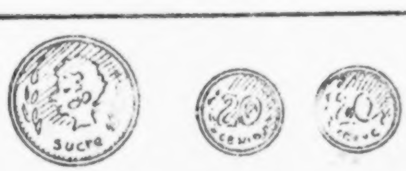
IV = 4 9 6



2º 4º 5º 1º 3º



$\frac{1}{4}$ $\frac{1}{10}$ $\frac{1}{2}$


Sucre
20
centavos
20

= s/.1,20 s/.1,40 s/.1,60

Tenía 6 bolas; jugando gané 3. ¿Cuántas bolas tengo ahora?

6	9	3

En la mesa hay 8 manzanas; cojo 3. ¿Cuántas quedan?

3	11	5

Un jabón cuesta 4 sucres. ¿Cuánto pago por 3 jabones?

12	7	8

El profesor tiene 5 camisetas y las regala a los 5 mejores alumnos. ¿Cuántas camisetas recibe cada uno?

5	0	1

$2 \times 5 = \boxed{10}\ \boxed{7}\ \boxed{8}$

$5 \times 0 = \boxed{5}\ \boxed{0}\ \boxed{6}$

$10 \div 2 = \boxed{5}\ \boxed{2}\ \boxed{20}$

$8 \div 4 = \boxed{n}\ \boxed{3}\ \boxed{8}$

REPUBLICA DEL ECUADOR
MINISTERIO DE EDUCACION PUBLICA

EVALUACION DE LOS TEXTOS ESCOLARES, GRUPO "B"

No. ______

Forma "B" ______

Variable
A. ☐
B. ☐
C. ☐

PRUEBA DE MATEMATICAS

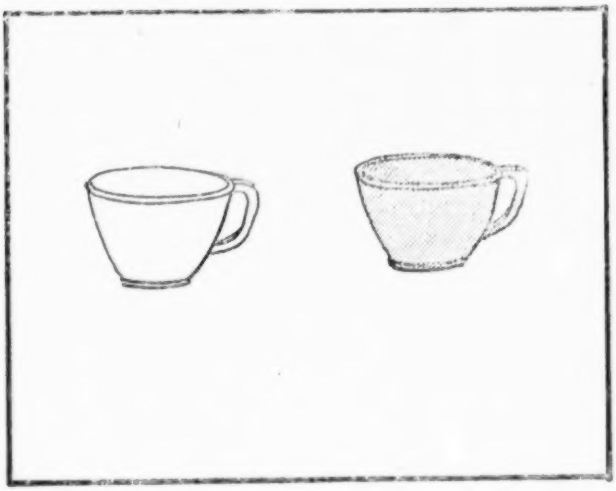
Nombre ______ Años Escolaridad ______

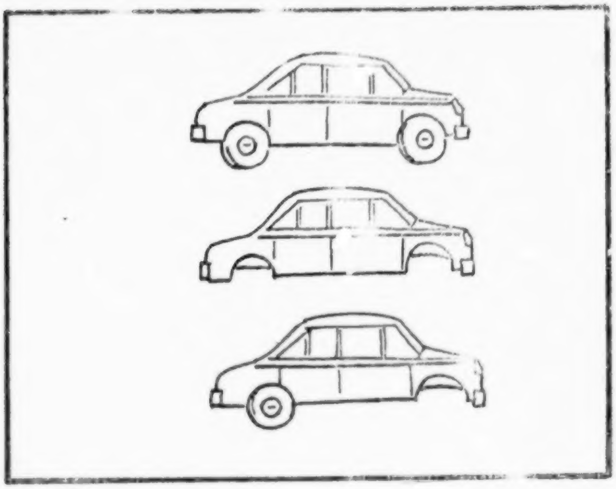
Escuela ______ Lugar ______

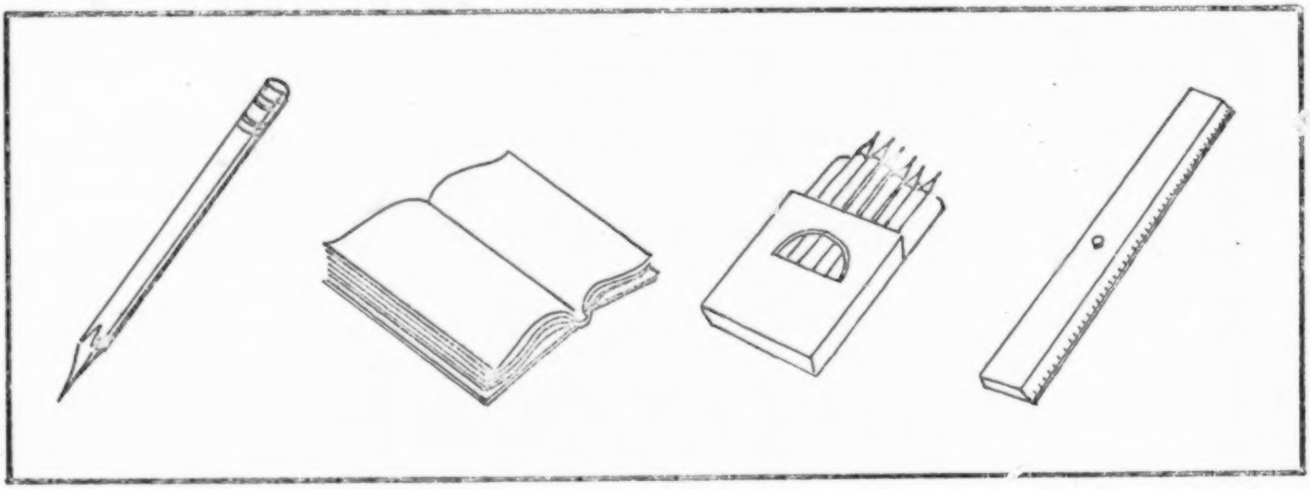
Fecha Aplicación ______

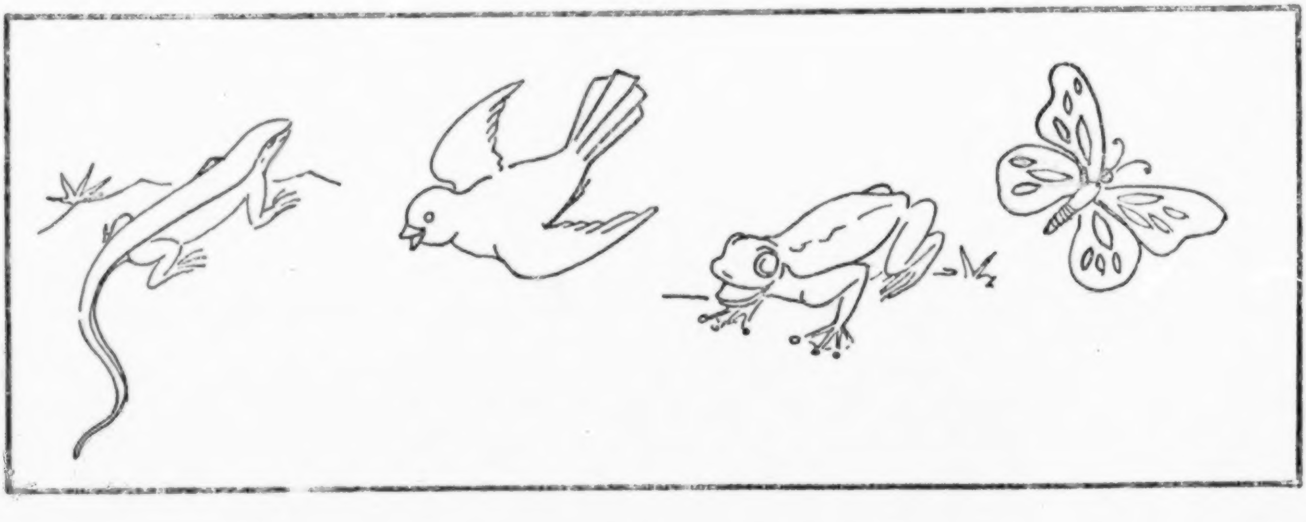
Investigador ______

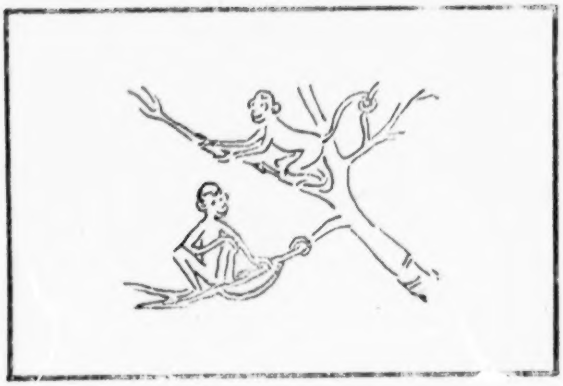
Prohibida la Reproducción–Derechos reservados Ministerio de Educación.

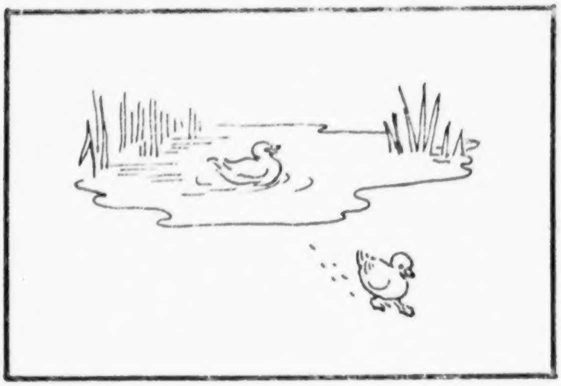


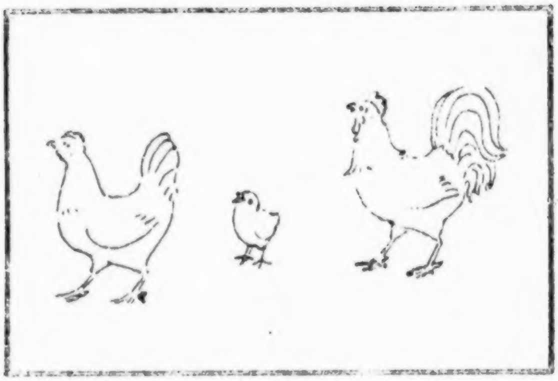


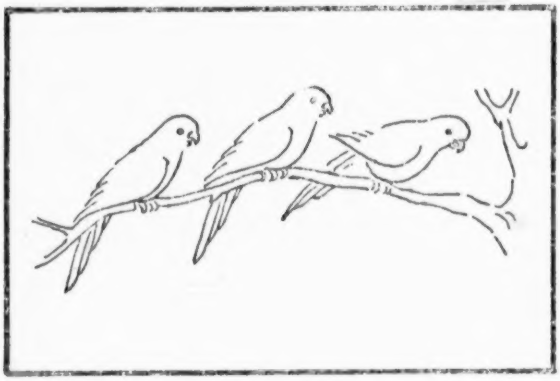


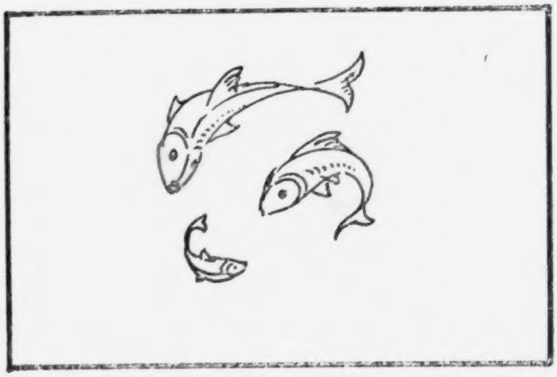


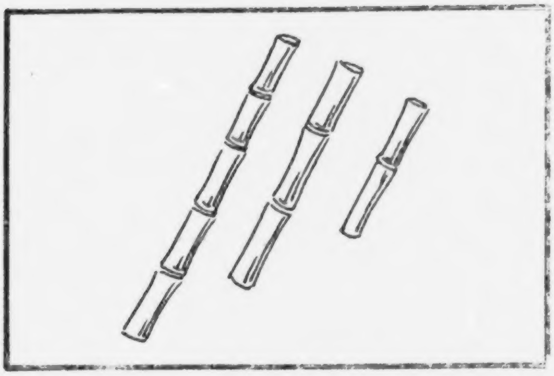


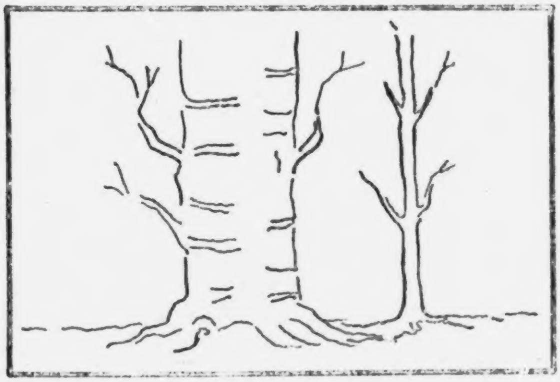


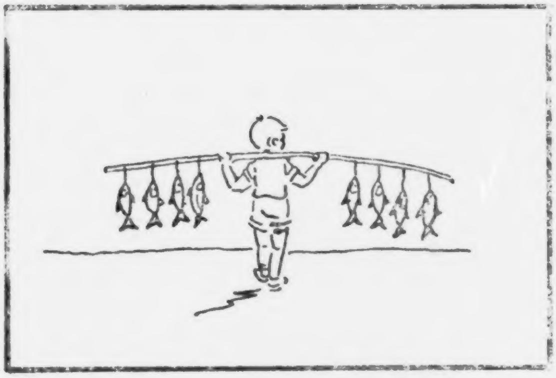


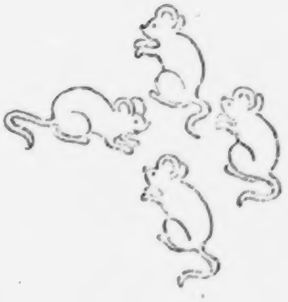


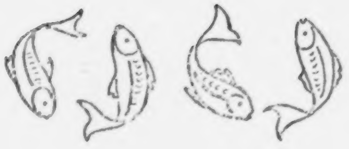


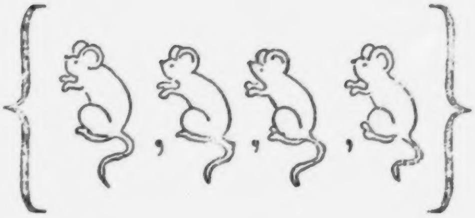


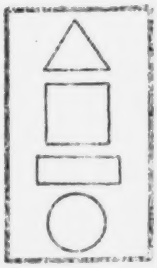


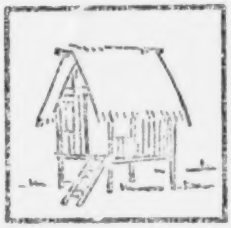


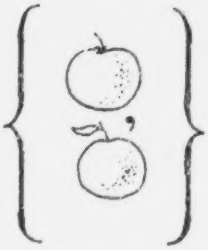


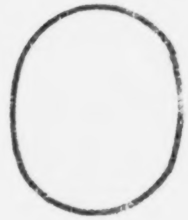


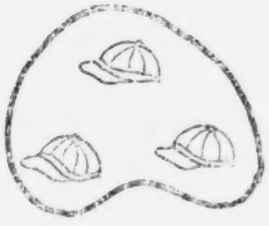


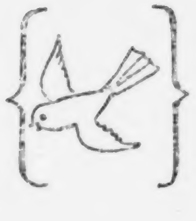


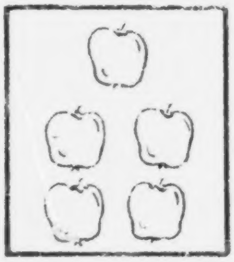


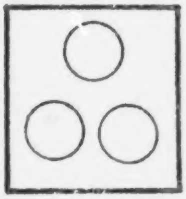


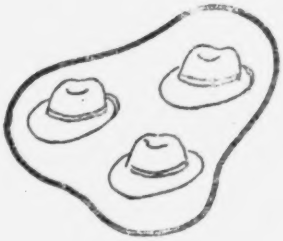
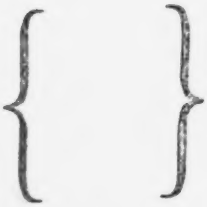
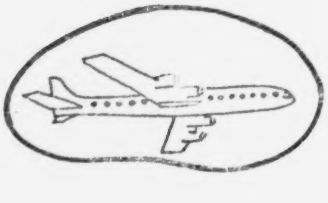
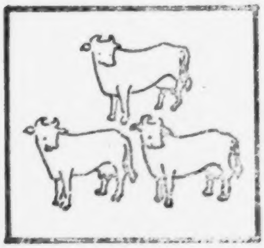
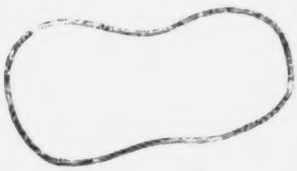
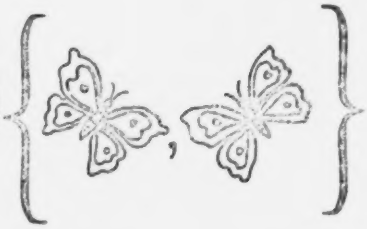
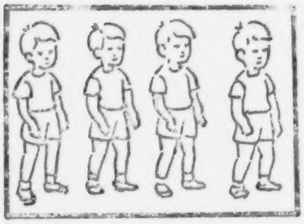
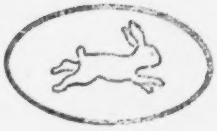
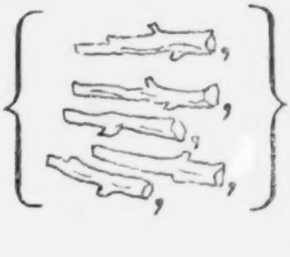
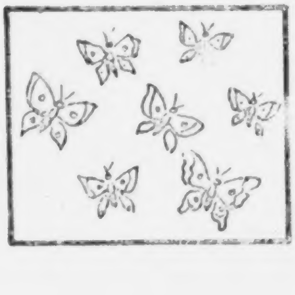
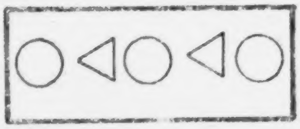
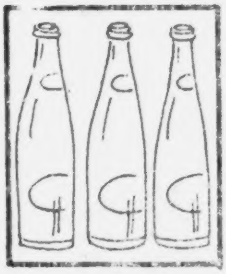


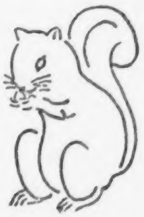






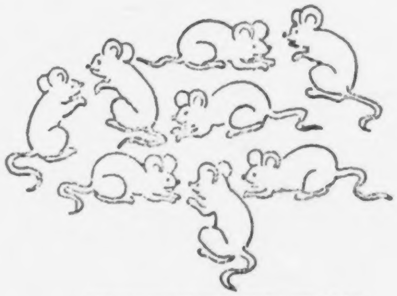


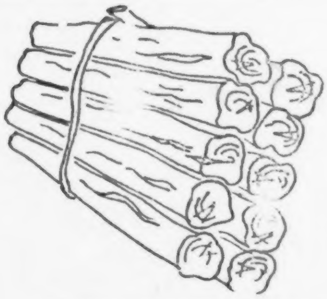


1 5 7

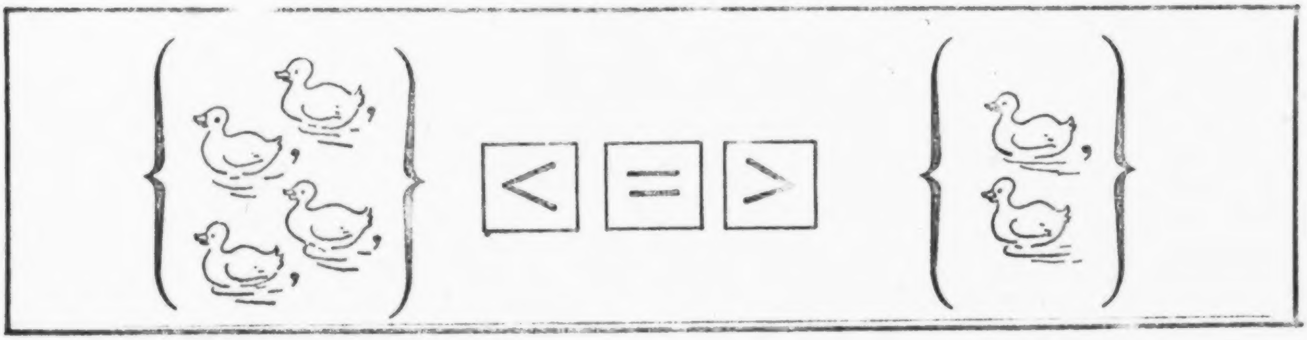
1 0 9

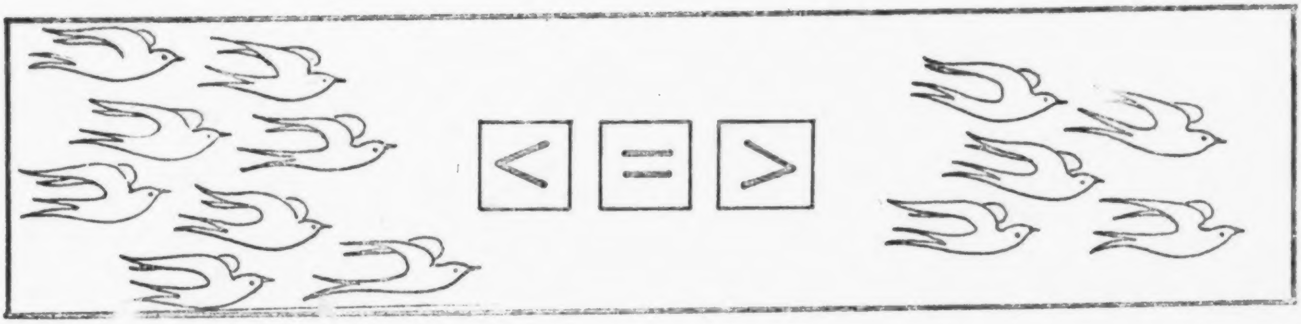


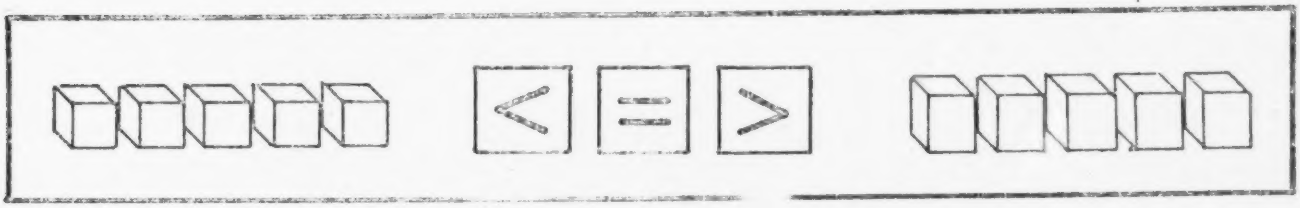
7 10 8



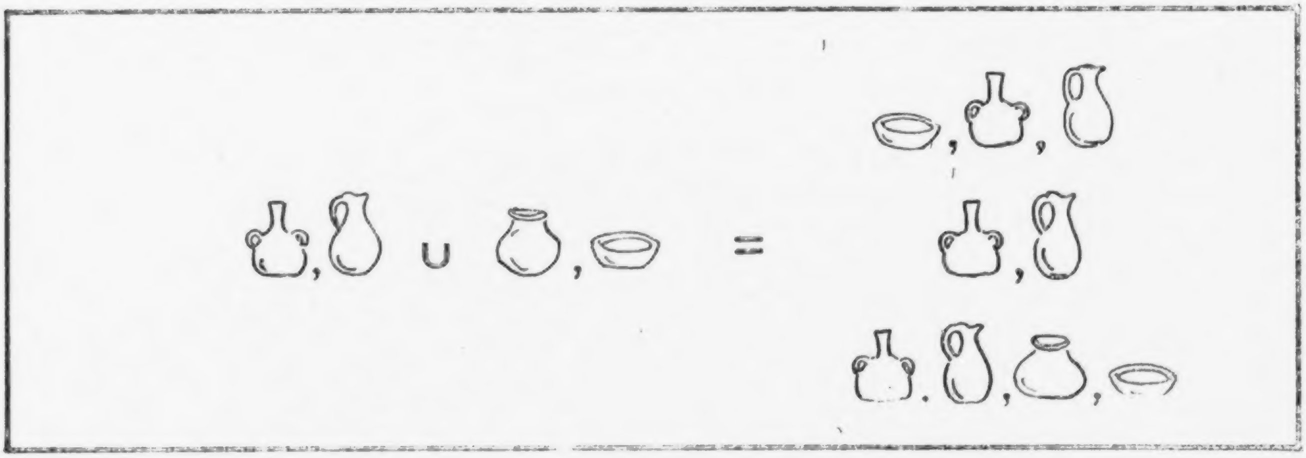
3 10 2

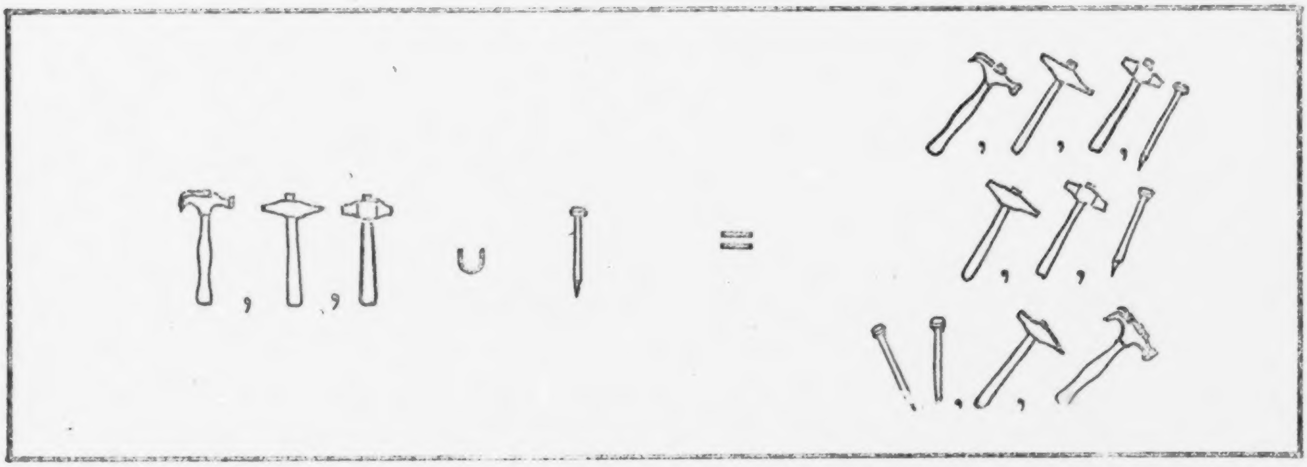






0 $\boxed{>}$ $\boxed{=}$ $\boxed{<}$ 8





$$\begin{array}{r} 3 \\ +\ 5 \\ \hline \end{array}$$

$\boxed{8}$ $\boxed{5}$ $\boxed{10}$

$$\begin{array}{r} 3 \\ +\ 0 \\ \hline \end{array}$$

$\boxed{0}$ $\boxed{3}$ $\boxed{5}$

$$\begin{array}{r} 10 \\ -\ 0 \\ \hline \end{array}$$

$\boxed{9}$ $\boxed{10}$ $\boxed{0}$

$$\begin{array}{r} 16 \\ -\ 4 \\ \hline \end{array}$$

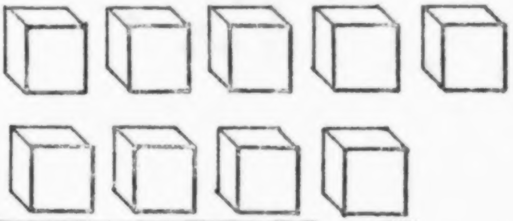
$\boxed{12}$ $\boxed{16}$ $\boxed{6}$

$$\boxed{4}\quad\boxed{3}\quad\boxed{2}\quad + 4 = 7$$

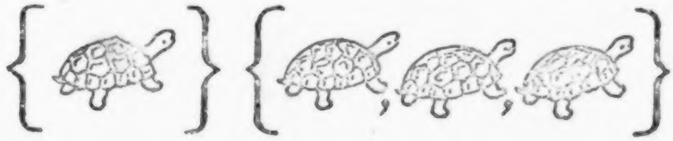
$$6 + \boxed{1}\quad\boxed{0}\quad\boxed{2}\quad = 8$$

$$(10 + 10) + 20 = \boxed{60}\quad\boxed{40}\quad\boxed{30}$$

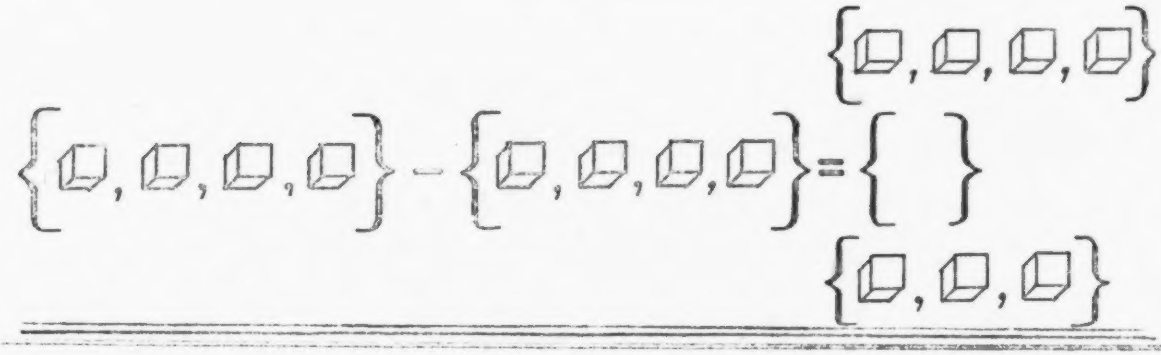
$$17 = 8 + 2 + \boxed{5}\quad\boxed{7}\quad\boxed{6}$$

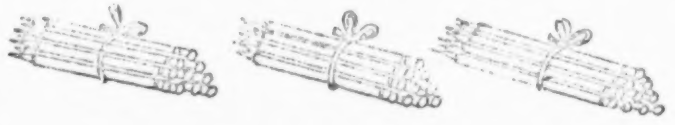


0 1 2

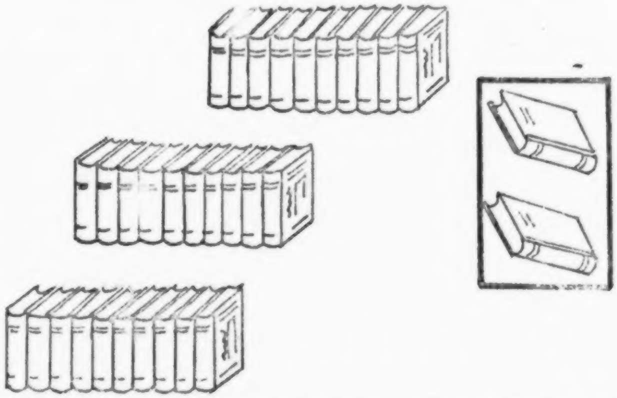


3 4 2





3	30		33



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2	22	32	42

1	2	3	4	5	6	7	8		10

1	9	10

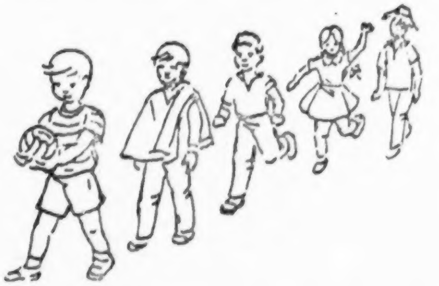
2	4	6		10	12	14	16	18	20

8	7	9

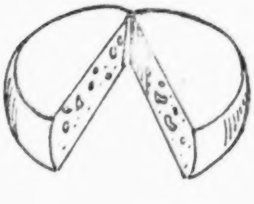
5	10	15	20	25	30		40	45	50

1	2	35

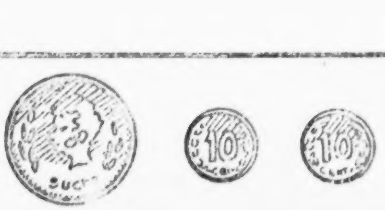
VI = 4 6 9



5º 3º 4º 1º 2º



$\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{3}$



= s/.1,50 s/.1,10 s/.1,20

Carlos tenía 4 bolas; gana 2. ¿Cuántas tiene ahora?

6 2 9

Mamá compró 10 manzanas; me regaló 2. ¿Cuántas quedaron?

12 8 5

Un cuaderno cuesta 2 sucres. ¿Cuánto pago por 4 cuadernos?

5 8 6

20 niños se separan para formar 2 equipos ¿Cuántos niños hay en cada equipo?

20 12 10

$1 \times 3 = \boxed{4}\ \boxed{3}\ \boxed{2}$

$10 \times 0 = \boxed{0}\ \boxed{10}\ \boxed{100}$

$10 \div 5 = \boxed{5}\ \boxed{1}\ \boxed{2}$

$3 \div 1 = \boxed{1}\ \boxed{n}\ \boxed{4}$

REPUBLICA DEL ECUADOR
MINISTERIO DE EDUCACION PUBLICA

EVALUACION DE LOS TEXTOS ESCOLARES -GRUPO "B"

No. ______

Forma "A"______

Variable A. ☐
B. ☐
C. ☐

PRUEBA DE CIENCIAS

Nombre______________________ Años Escolaridad ____________

Escuela______________________ Lugar______________________

Fecha Aplicación______________________________________

Investigador____

Prohibida la Reproducción-Derechos reservados Ministerio de Educación

PRUEBA ______________________________

FORMA ______________________________

APLICACION ______________________________

ESCUELA ______________________________

PRIMER GRADO ______________________________

PROVINCIA ______________________________

CANTON ______________________________

PARROQUIA ______________________________

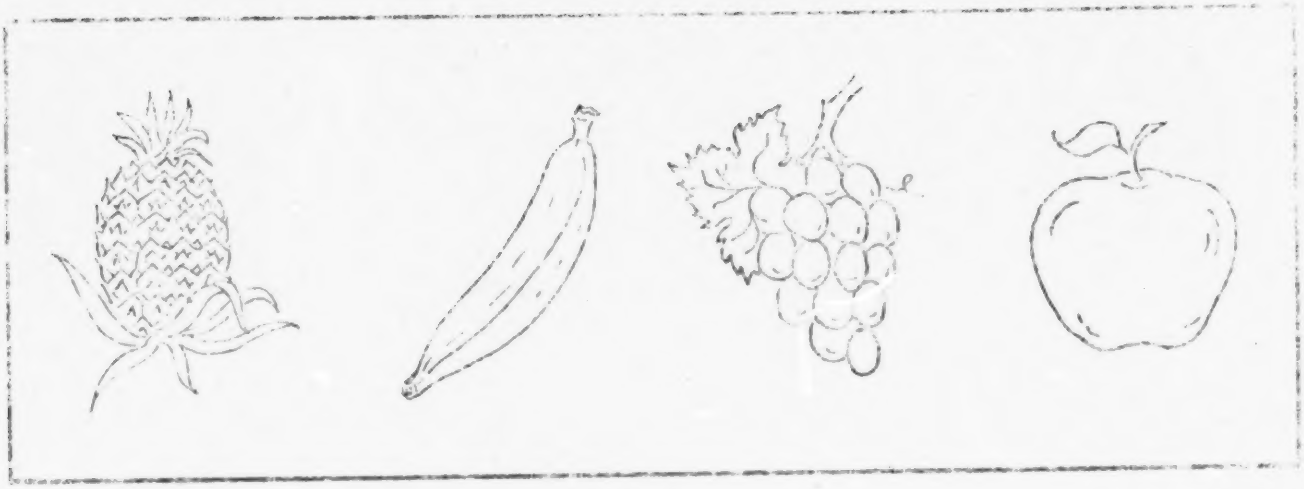
PROFESOR ______________________________

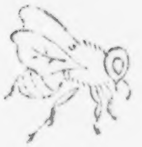
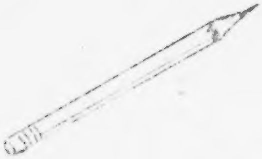
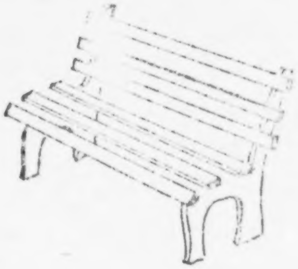
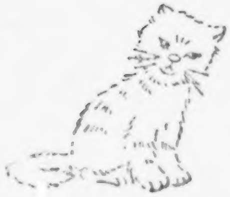
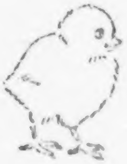
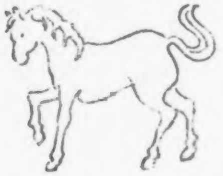
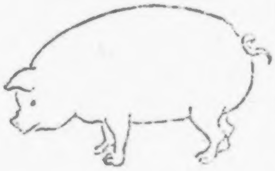
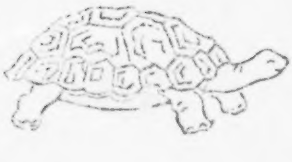
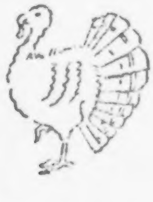
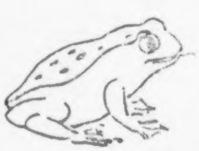
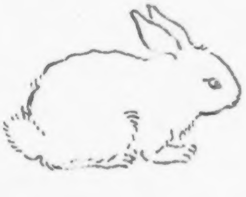
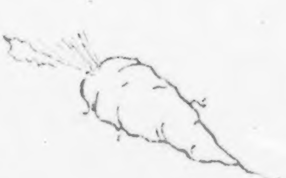
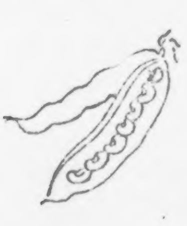
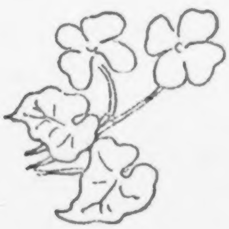
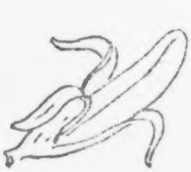
SUPERVISOR ______________________________

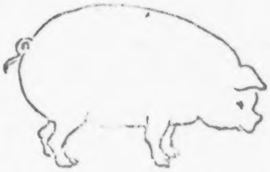
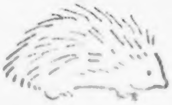
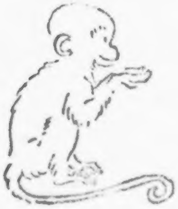
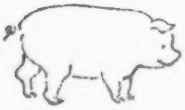
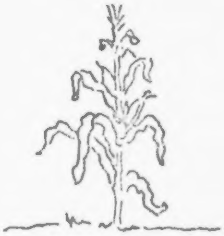
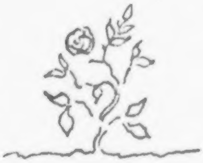
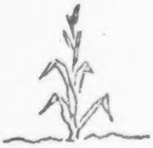
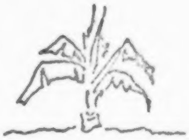
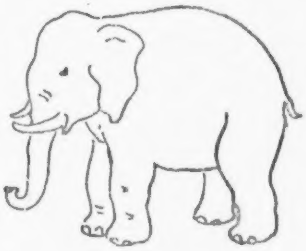
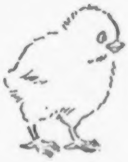
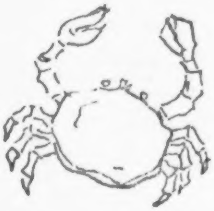
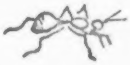
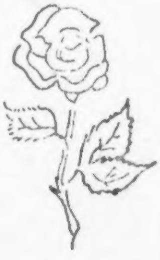
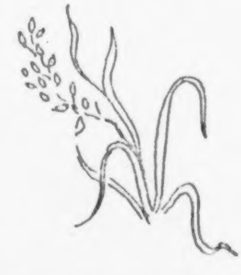
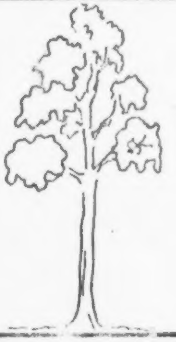
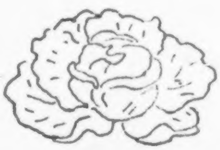
INVESTIGADOR ______________________________

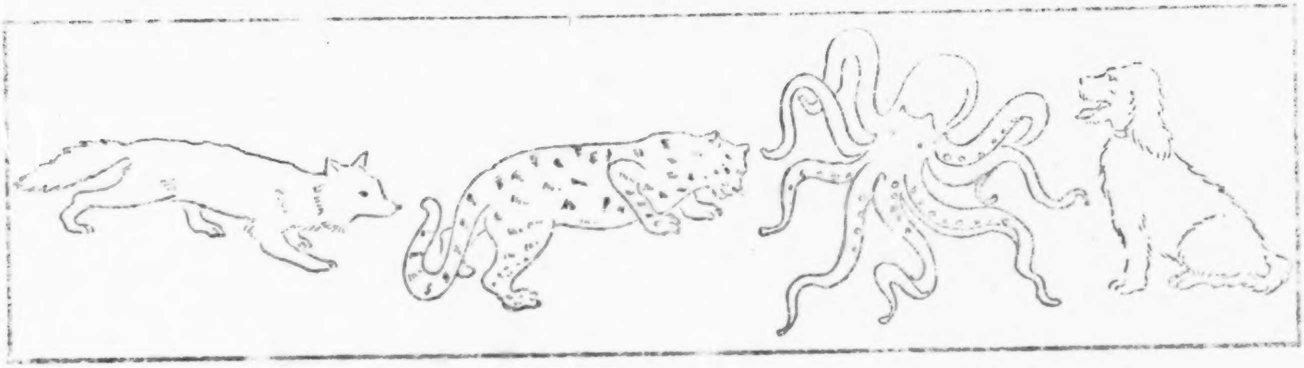
FECHA ______________________________

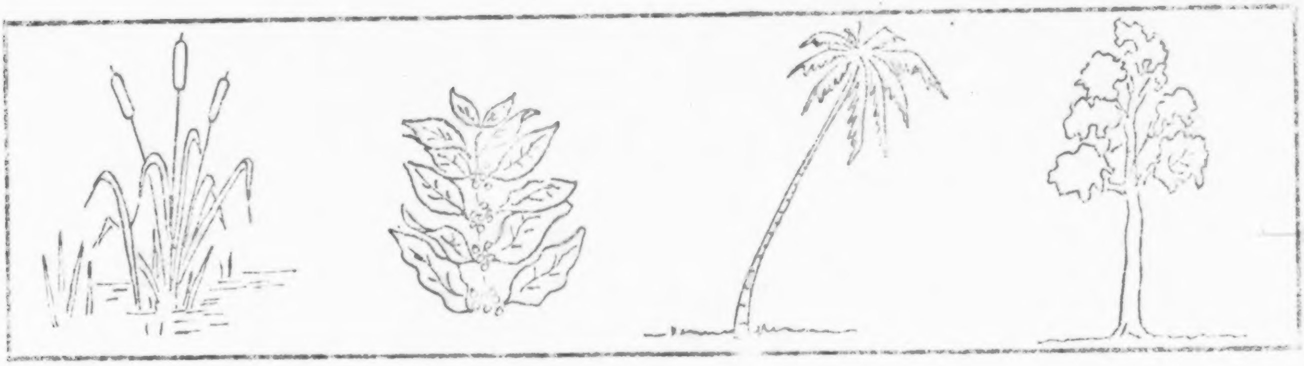
QUITO-ECUADOR

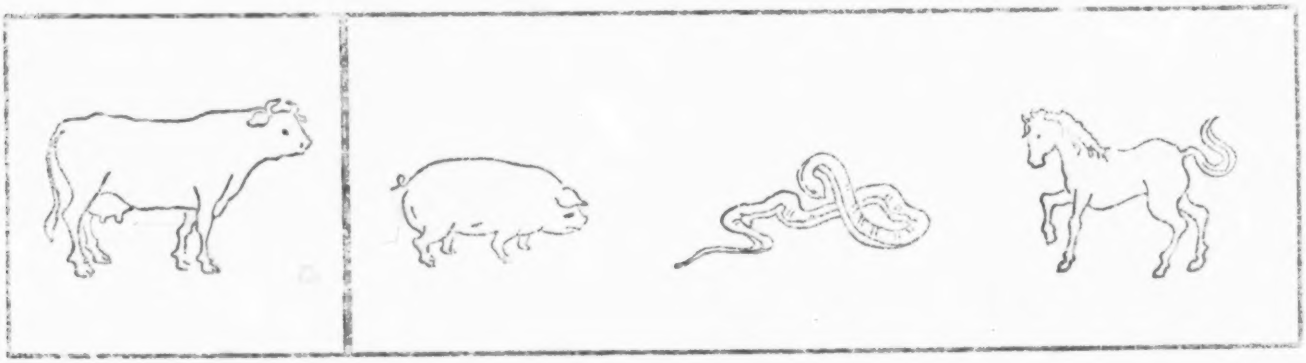


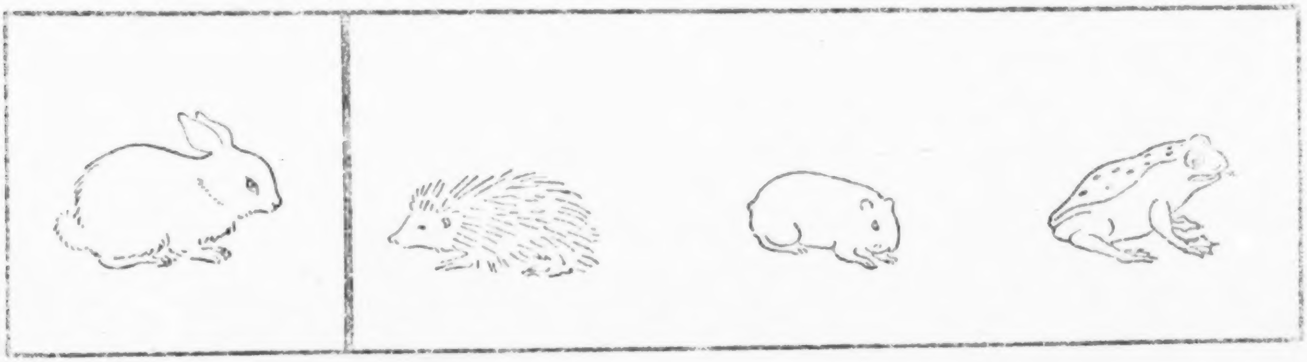
















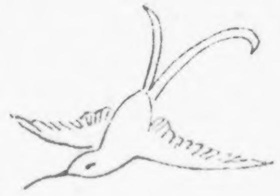
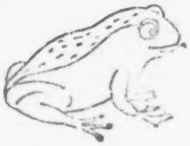
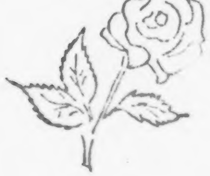
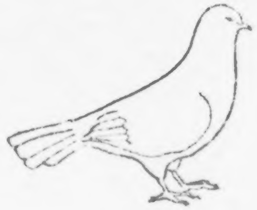

















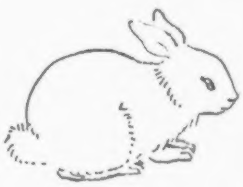
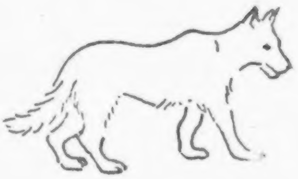
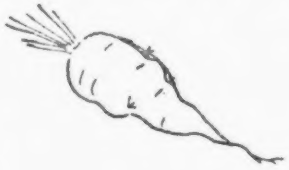
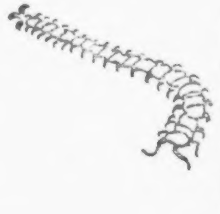


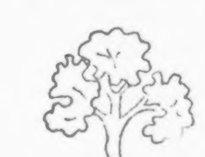
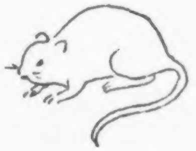
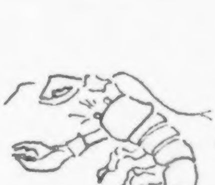
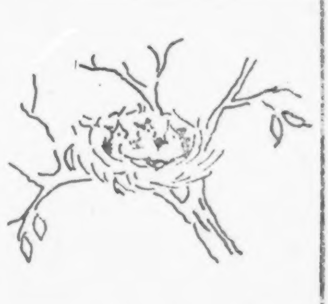


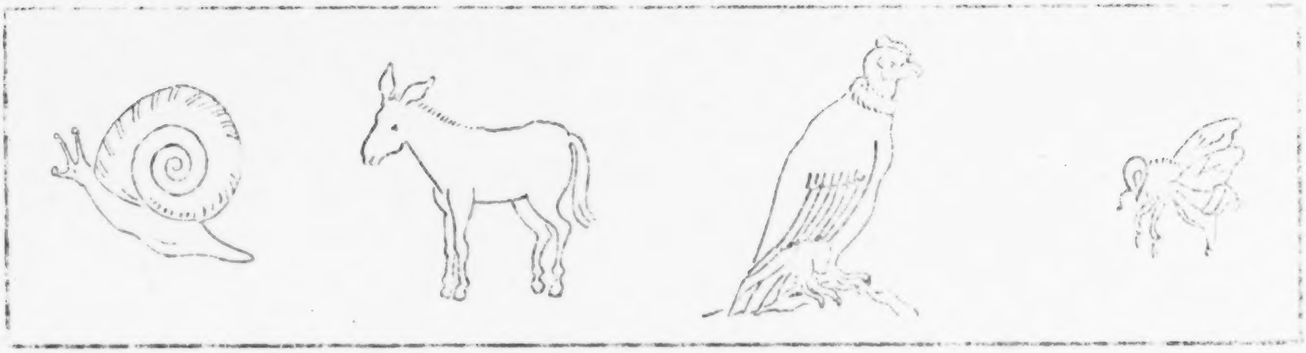


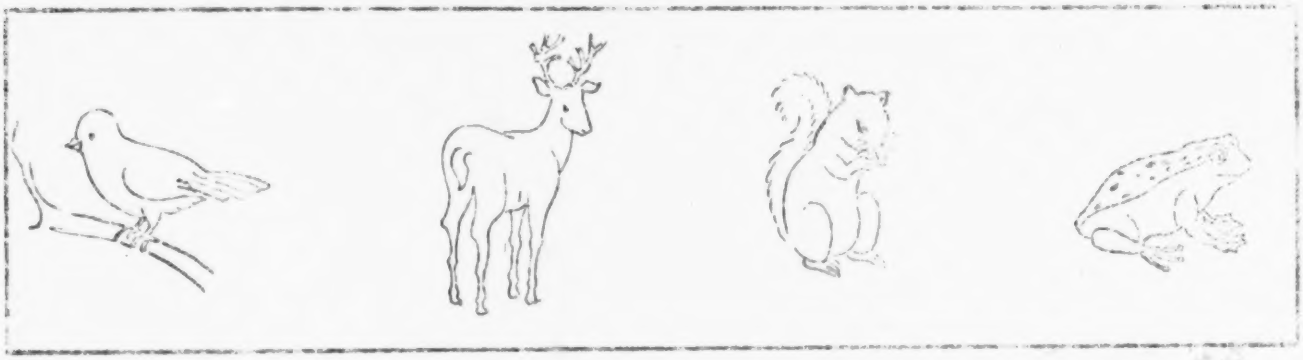


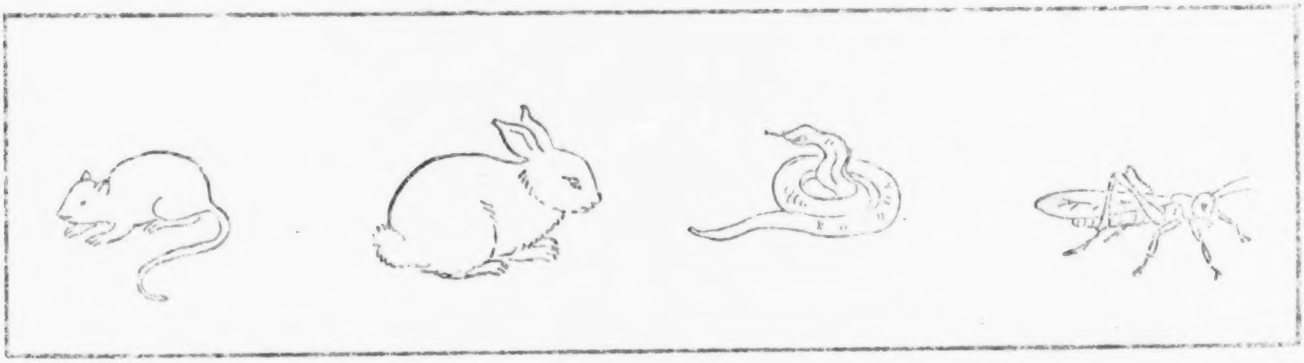





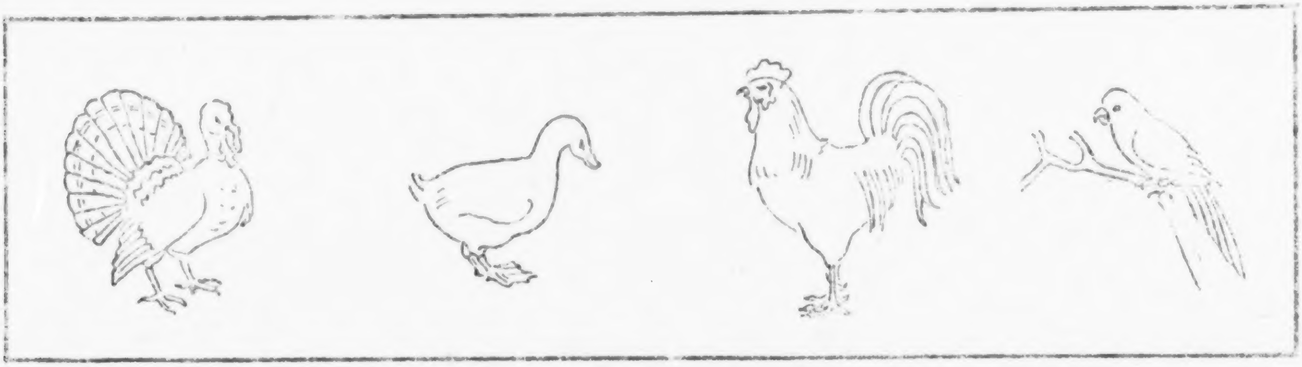





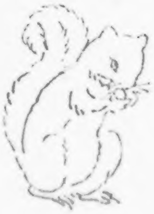
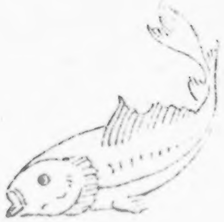
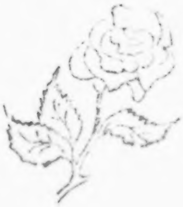
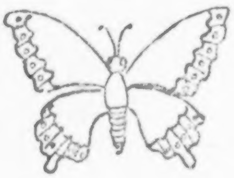
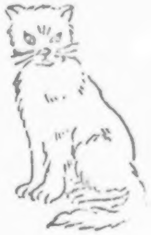
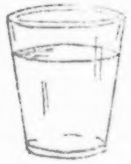
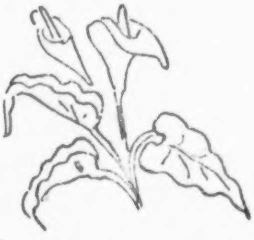
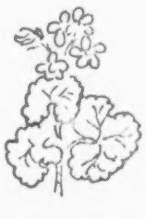
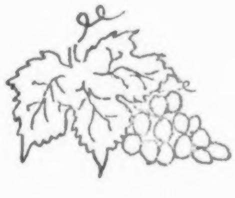













agua

vestido

juego

amigos

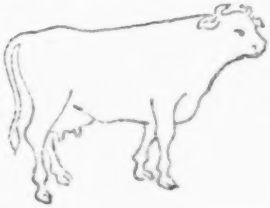
aire

muebles

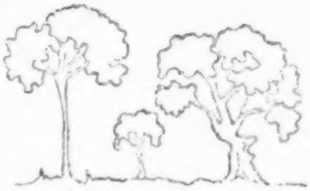
flores

hojas

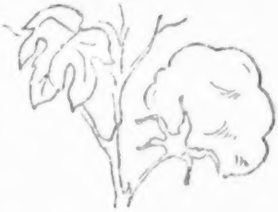
alimento



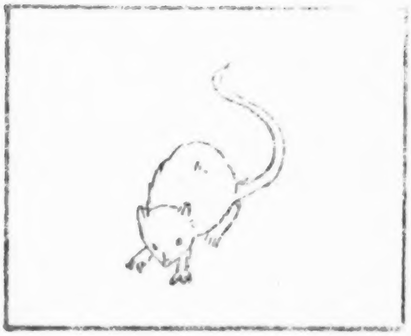
lana	huevos	piel



nidos	frutos	ardillas



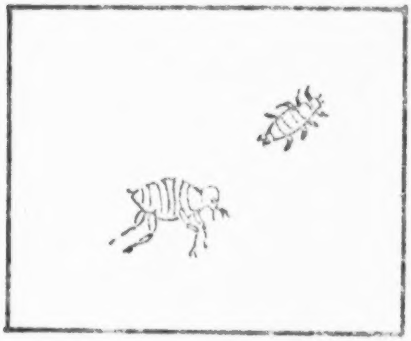
fibras	flores	frutos



Tiene cola.

Trae enfermedades.

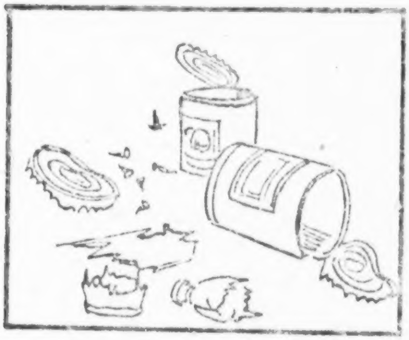
Cae en la trampa.



Causa el paludismo

Zumba

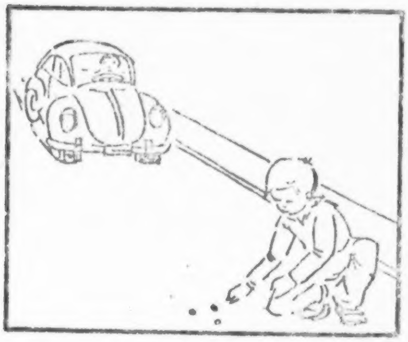
Es feo



Sirven para jugar.

Son útiles.

Producen heridas.



Jugar en la calle.

Ir a la escuela.

Caminar despacio.

se bañan muy poco.

comen buenos alimentos.

comen golosinas.

se hacen vacunar.

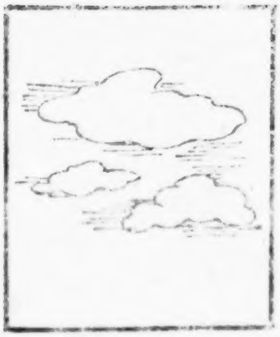
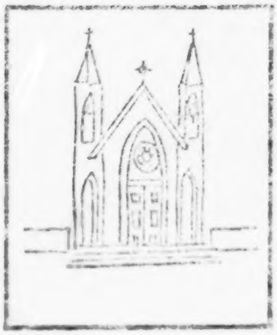
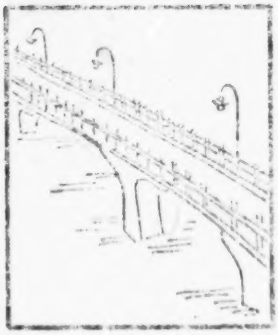
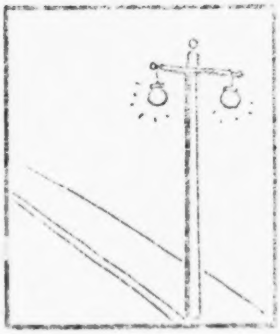
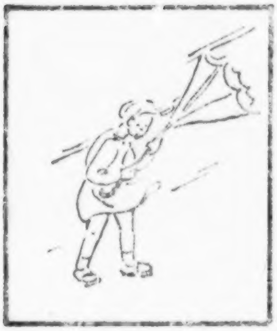
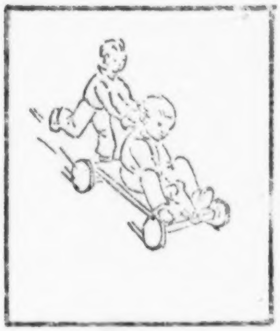
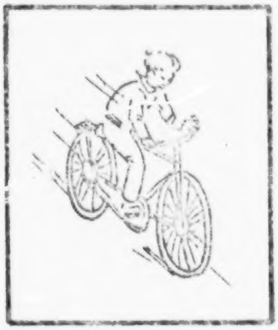
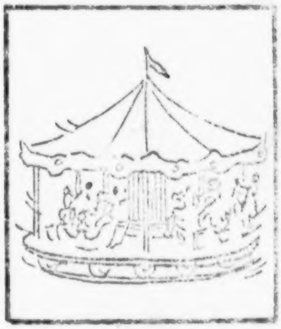
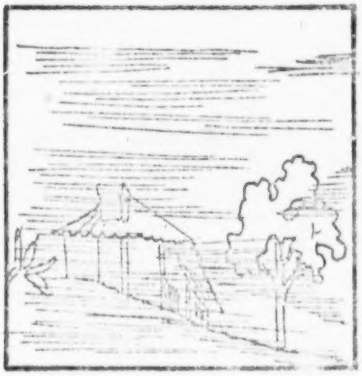
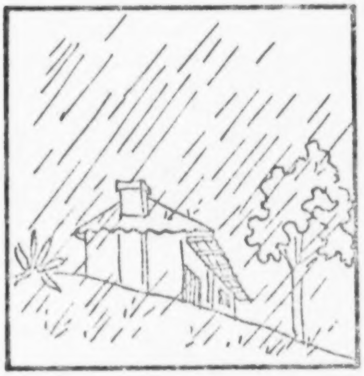
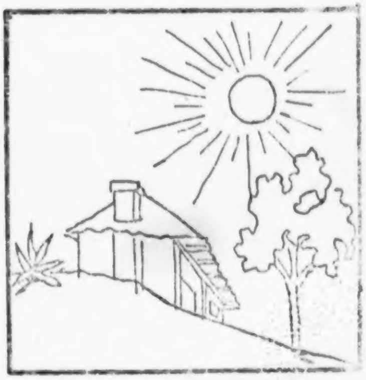
se asean diariamente.

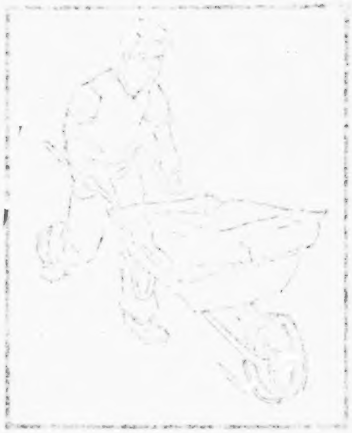
Hay días y noches porque la tierra gira.

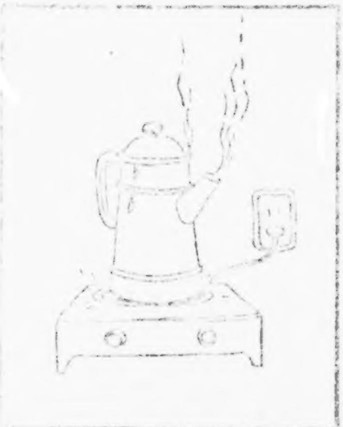
La tierra no se mueve.

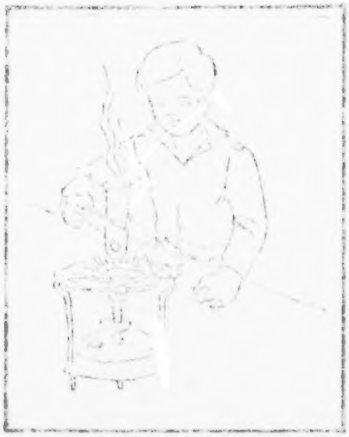
Hay temblores porque la tierra gira.

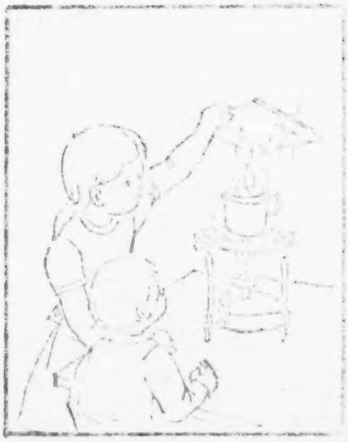
La tierra se mueve.

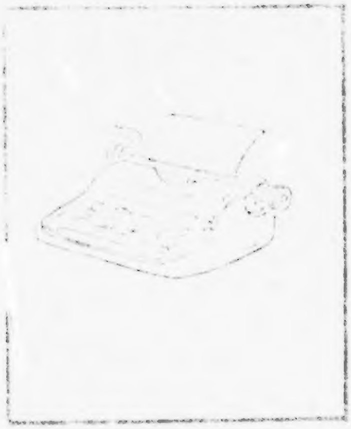












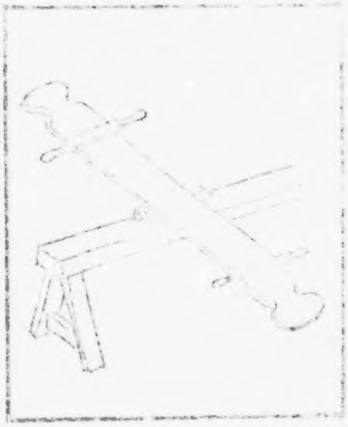


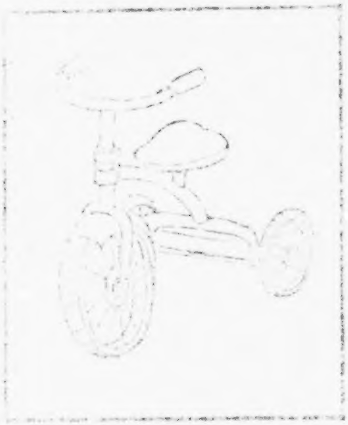


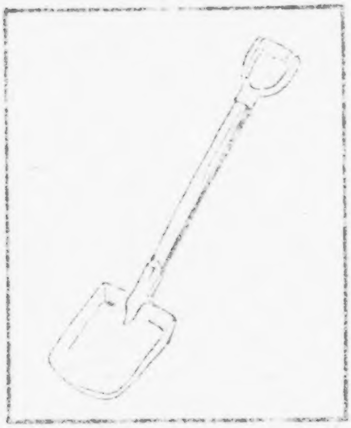


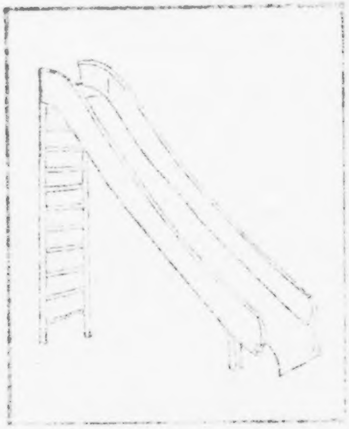


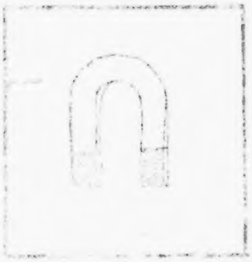


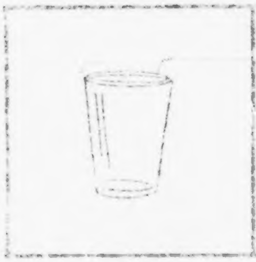


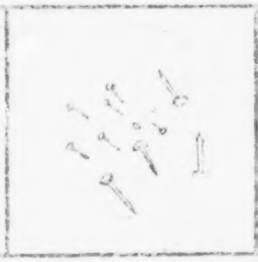


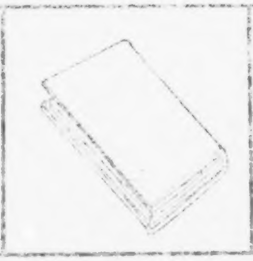


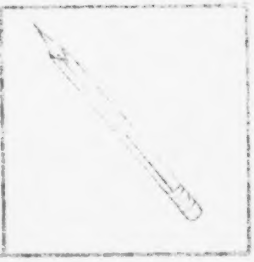


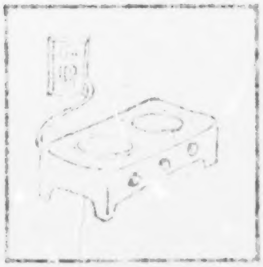


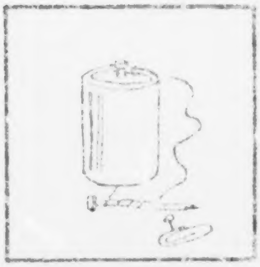


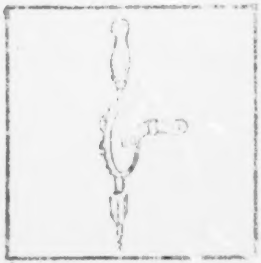












Alumbro las casas
caliento planchas y cocinas
muevo muchas máquinas
ayudo a trabajar.
¿Quién soy?

sol

electricidad

hombre

focos

La parte más importante de muchas máquinas es

la rueda

el mueble

la marca

El sonido viaja por

cartas

aire

avión

REPUBLICA DEL ECUADOR
MINISTERIO DE EDUCACION PUBLICA

EVALUACION DE LOS TEXTOS ESCOLARES, GRUPO "B"

No. ____________

Forma "B" ______________

Variable
A. ☐
B. ☐
C. ☐

PRUEBA DE CIENCIAS

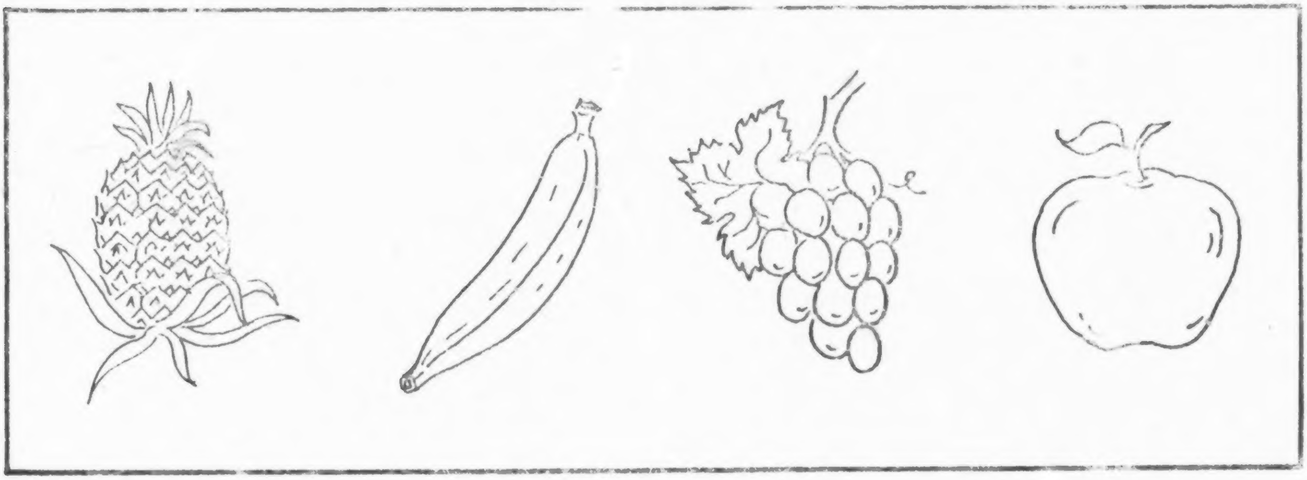
Nombre ______________________________ Años Escolaridad ______________________

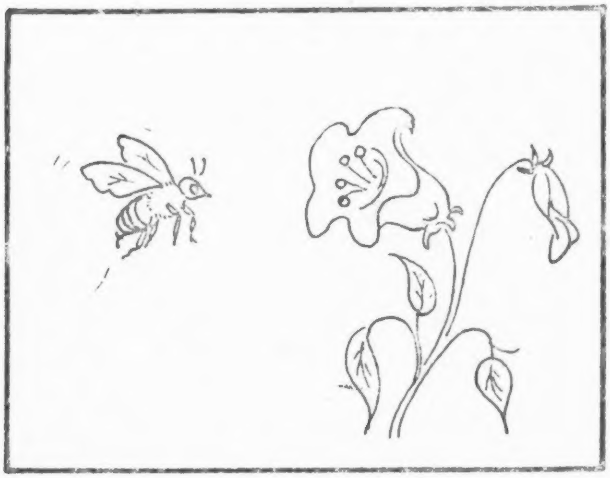
Escuela ______________________________ Lugar ______________________________

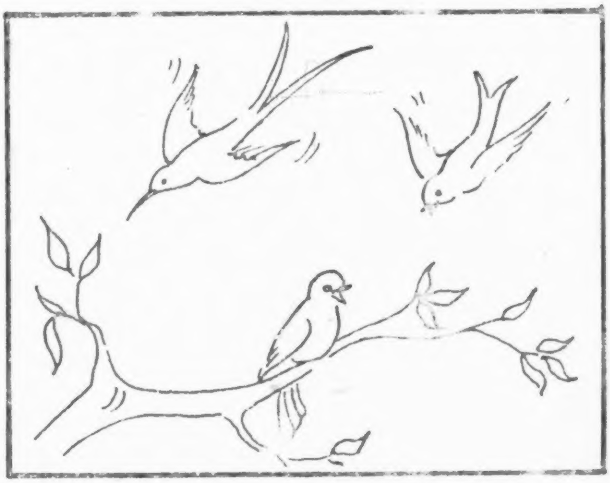
Fecha Aplicación ____

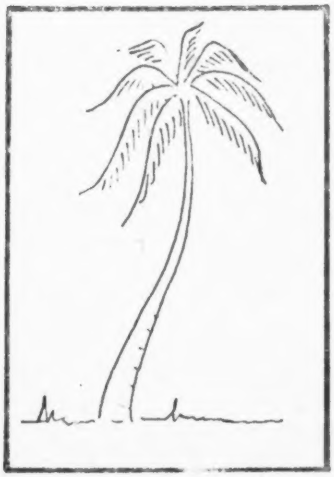
Investigador ____

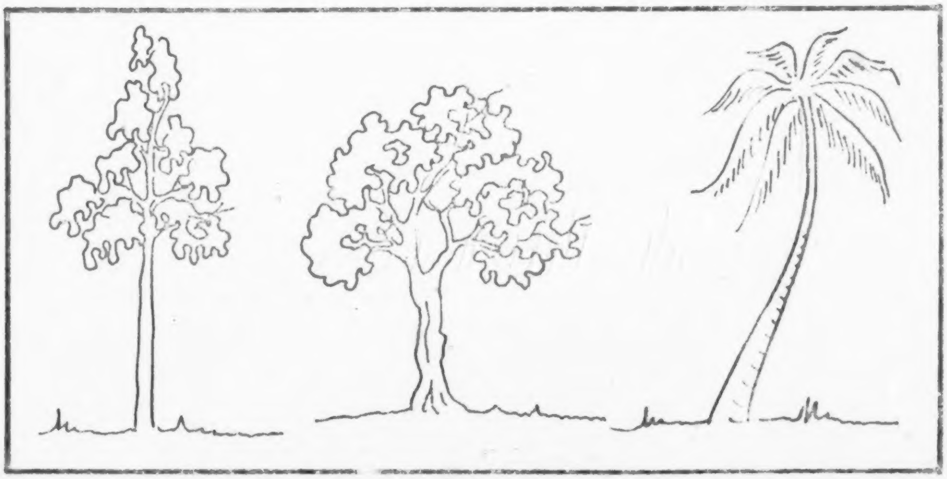
Prohibida la Reproducción—Derechos reservados Ministerio de Educación.

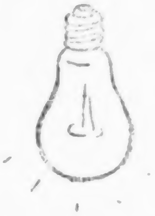
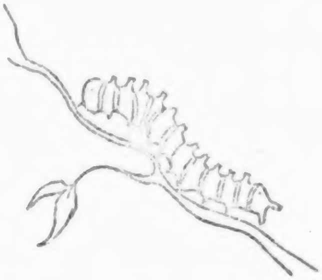
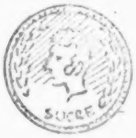








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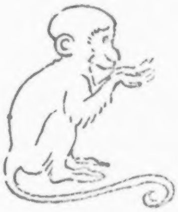
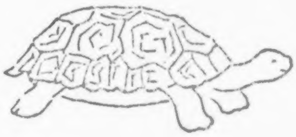
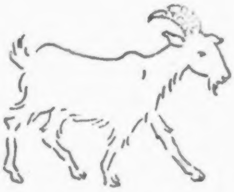
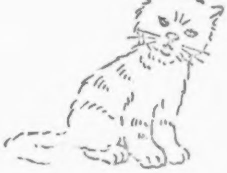
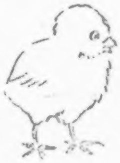
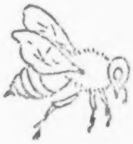
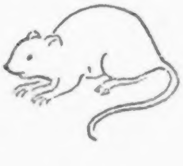
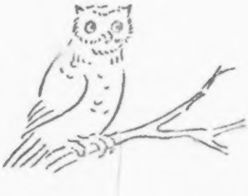
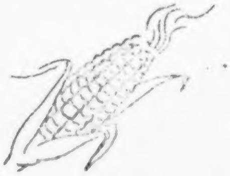
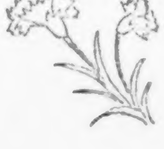
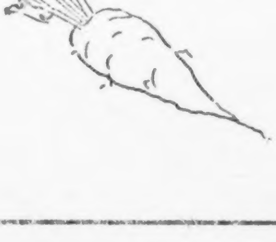
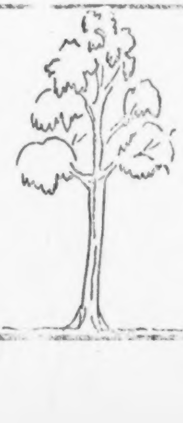
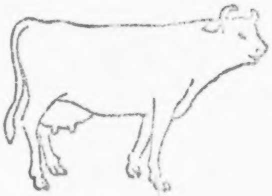
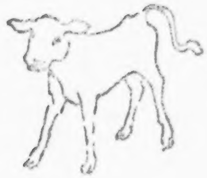
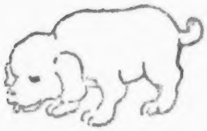
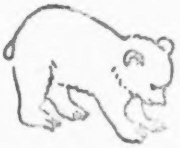
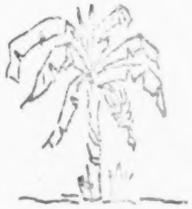
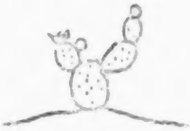
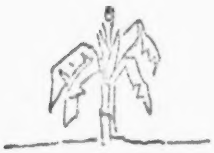
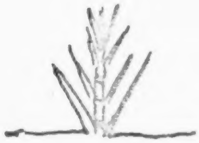
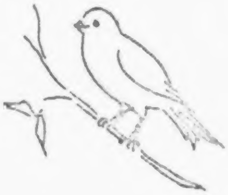
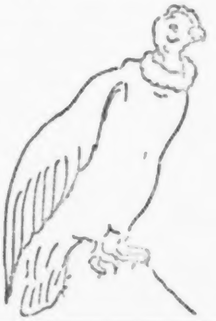
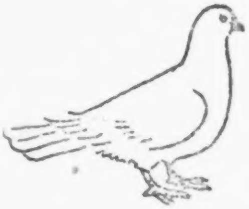
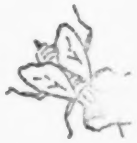
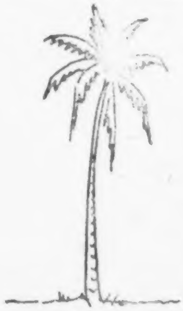
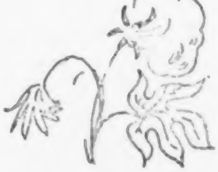
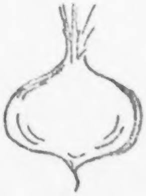
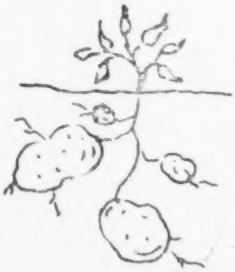
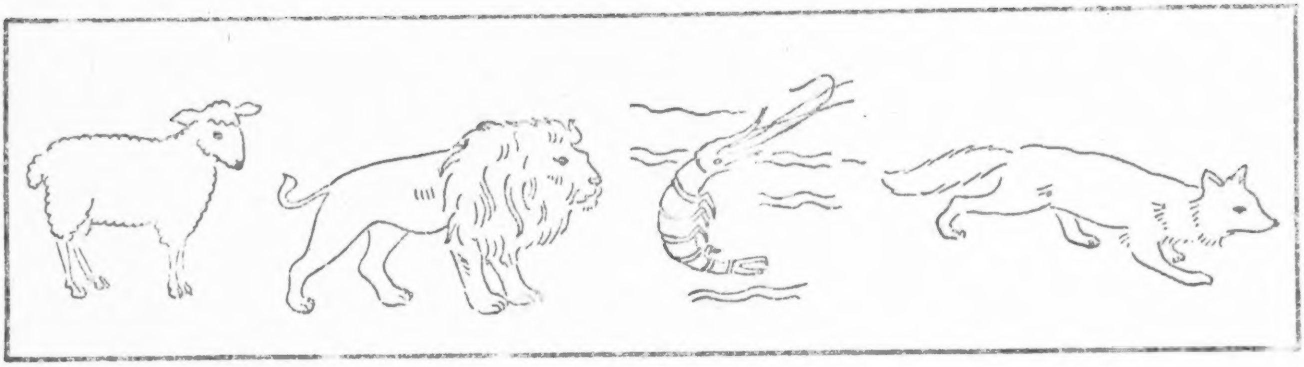
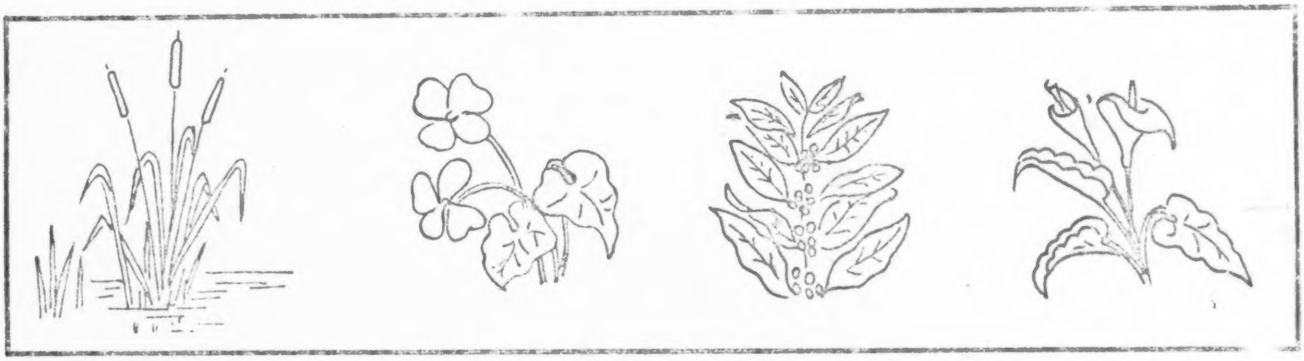
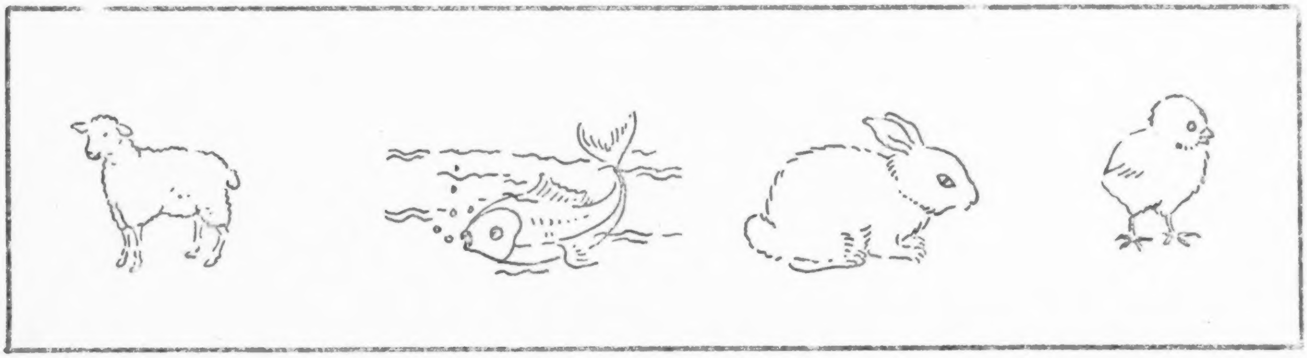
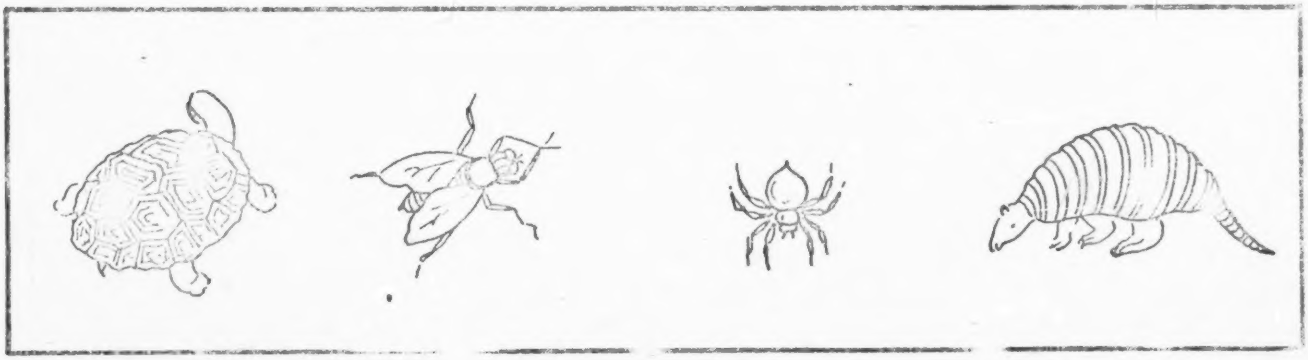













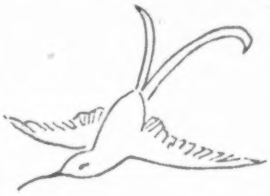
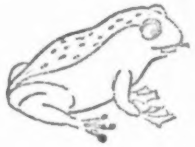
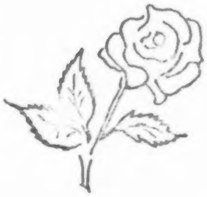
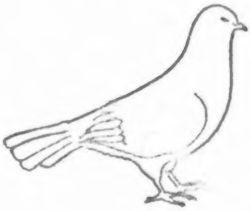
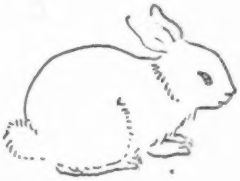
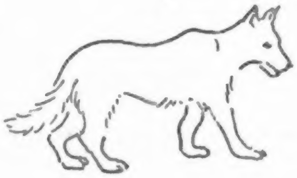
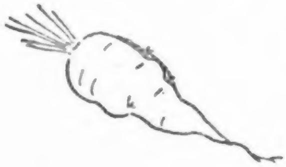
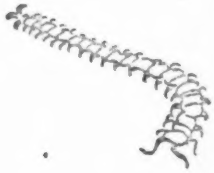
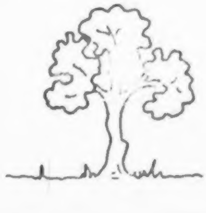
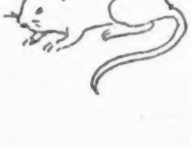
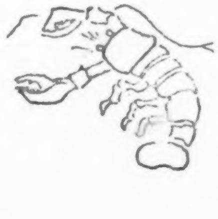
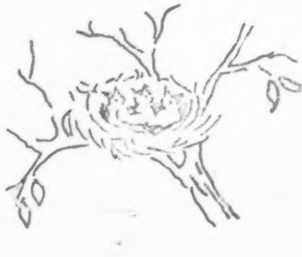

















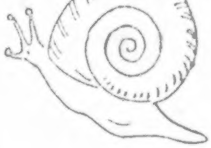
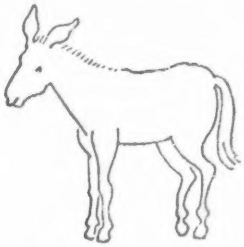
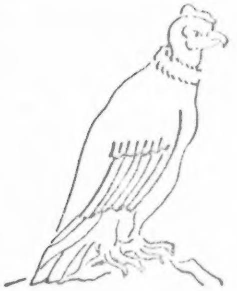
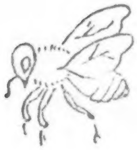
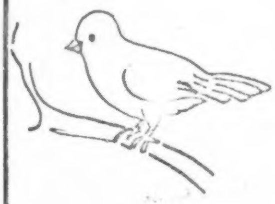
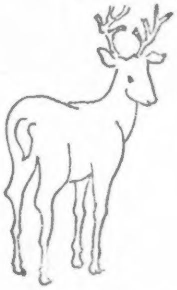
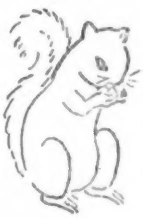
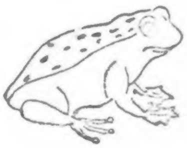
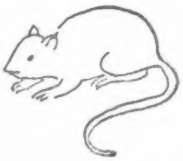
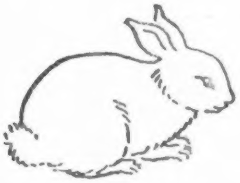
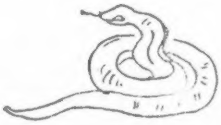
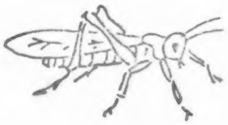
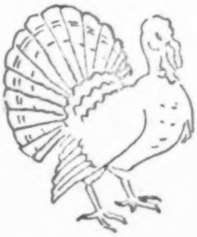
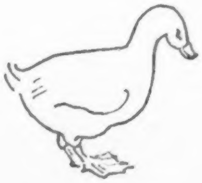
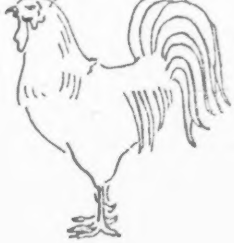
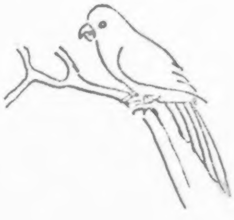


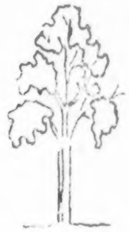


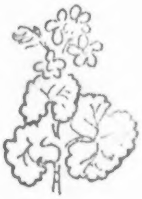


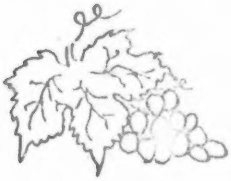


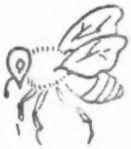













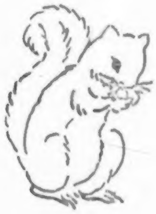

















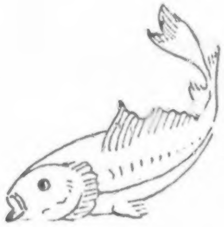


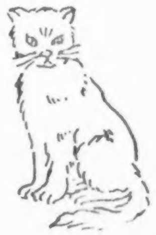


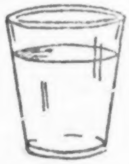


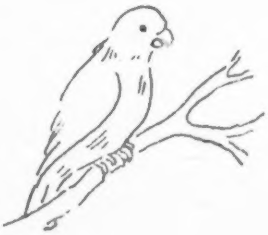


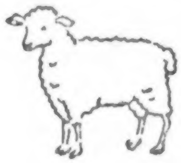




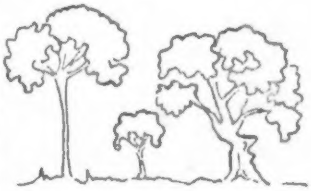




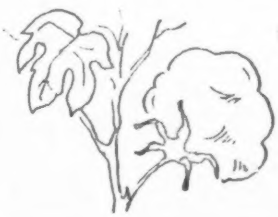




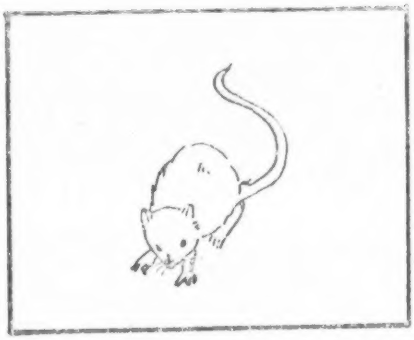
lana plumas caparazón



maderas nidos ardillas



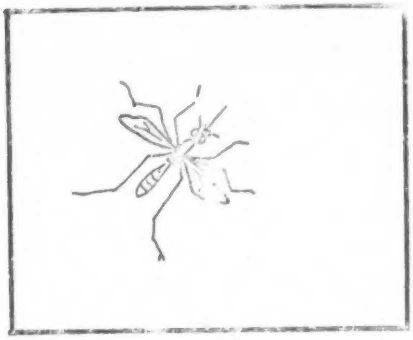
flores frutos fibras



Tiene cola.

Trae enfermedades.

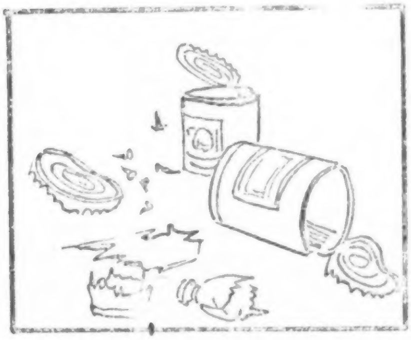
Cae en la trampa.



Causa el paludismo

Zumba

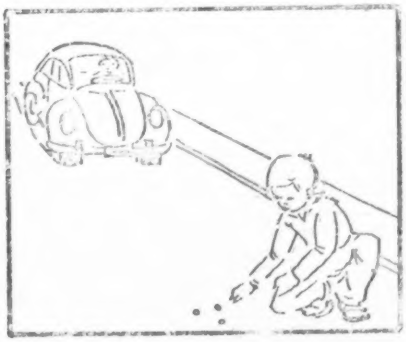
Es feo.



Sirven para jugar.

Son útiles.

Producen heridas.



Jugar en la calle.

Ir a la escuela.

Caminar despacio.

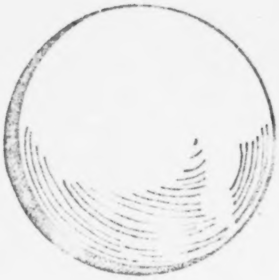
duermen muy tarde

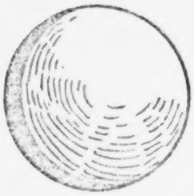
comen buenos alimentos.

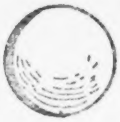
se hacen vacunar.

comen golosinas.

se asean diariamente.





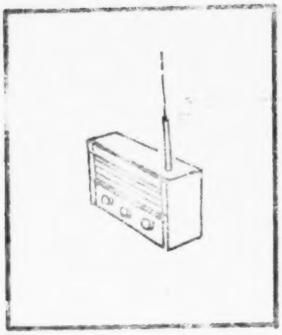
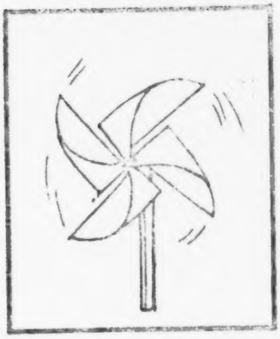
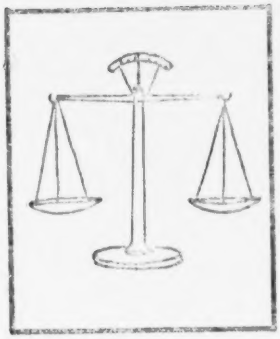
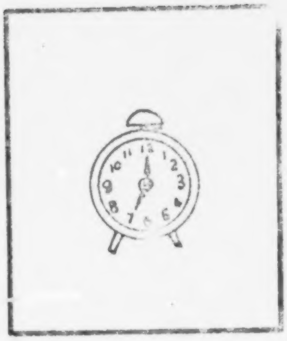
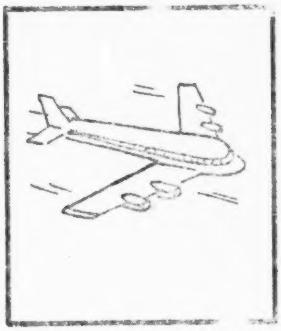
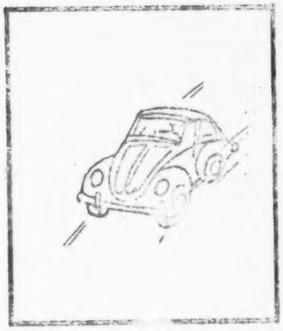
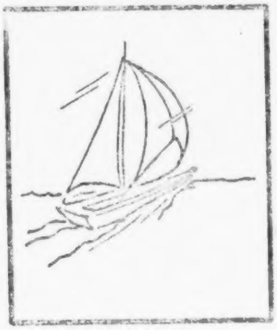
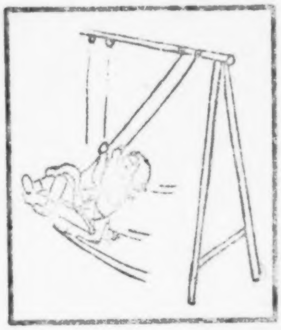
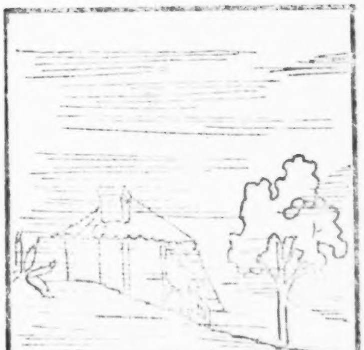
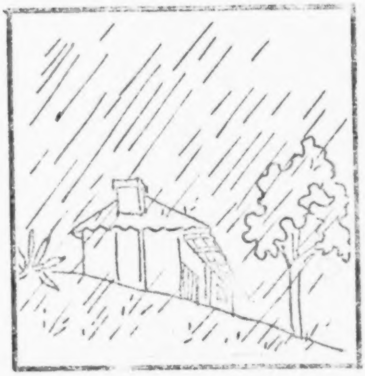
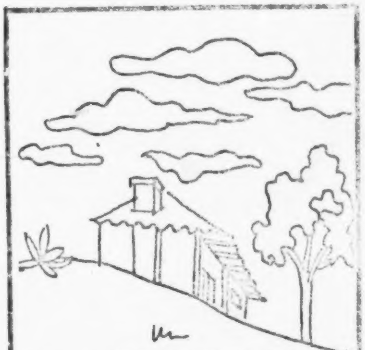


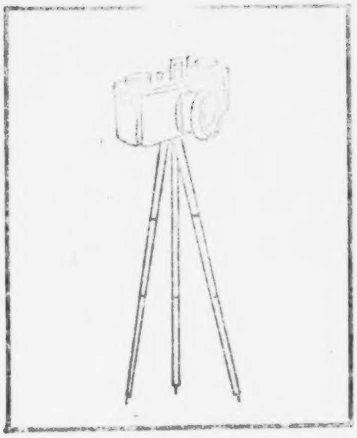
La tierra se mueve.

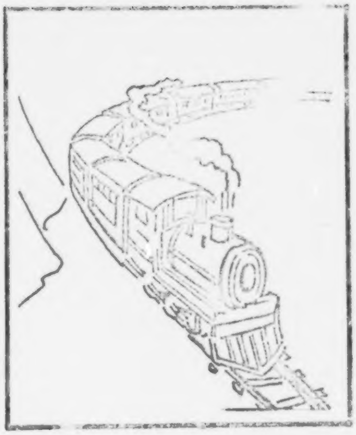
La tierra no se mueve.

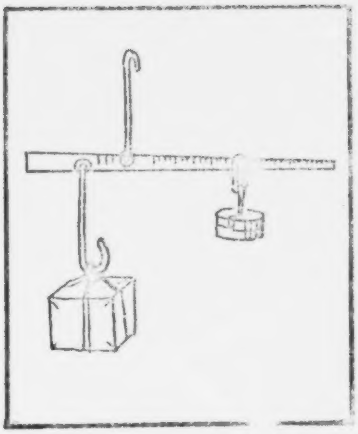
Hay lluvia porque la tierra gira.

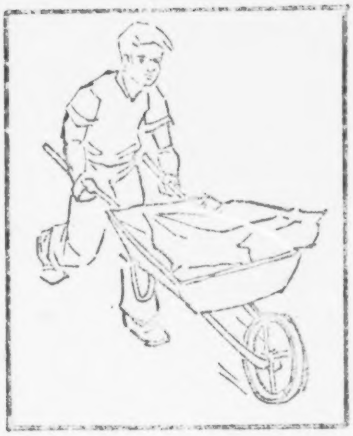
Hay días y noches porque la tierra gira.

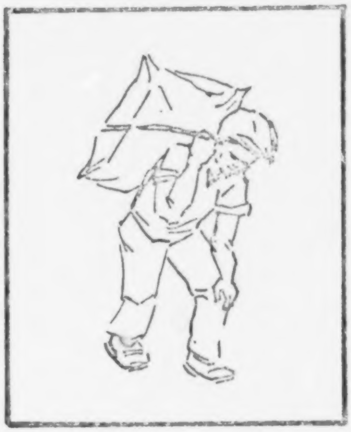












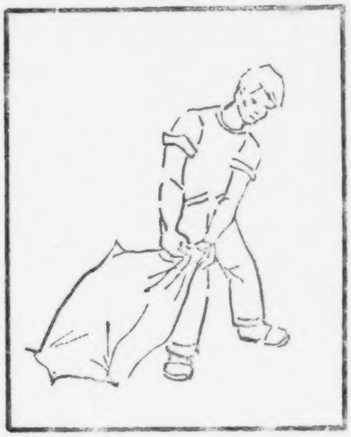


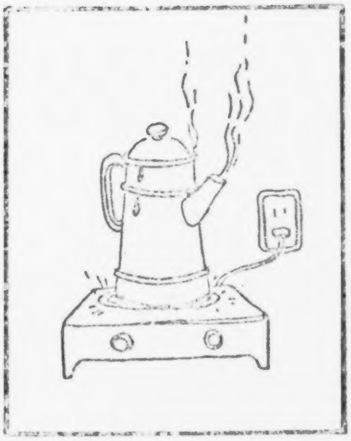


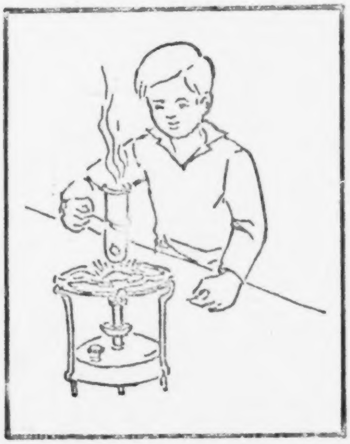


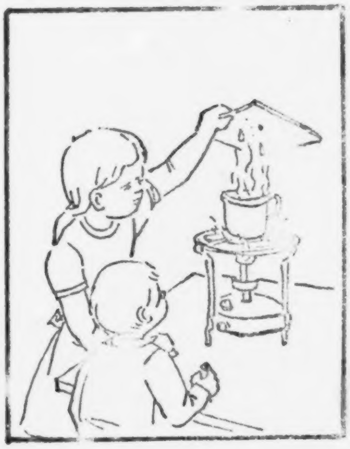


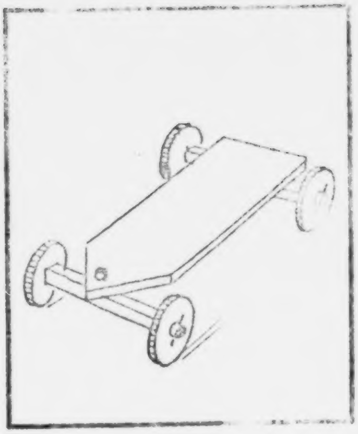
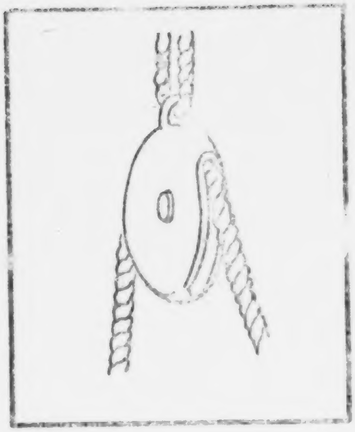
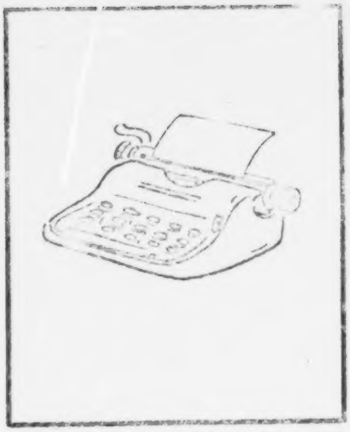
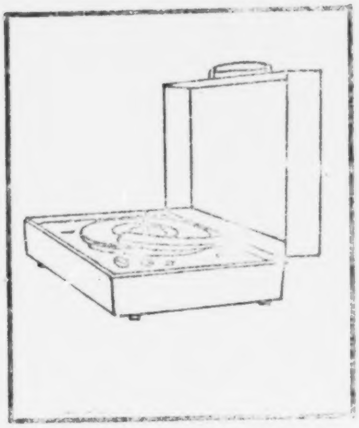
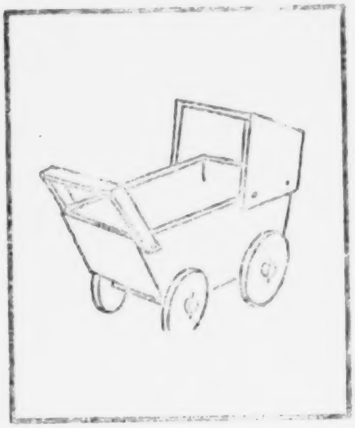
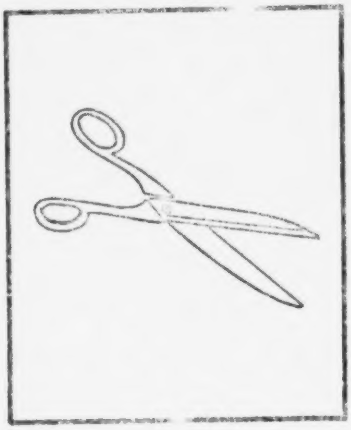
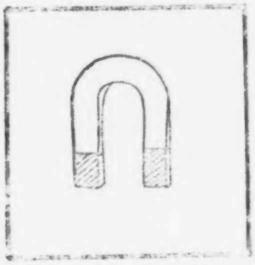
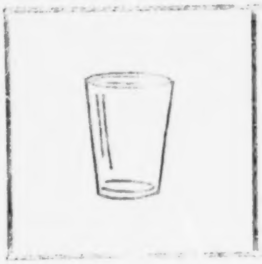
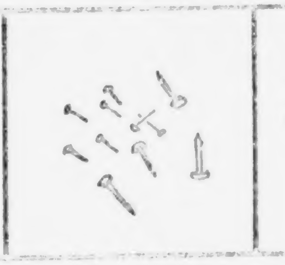
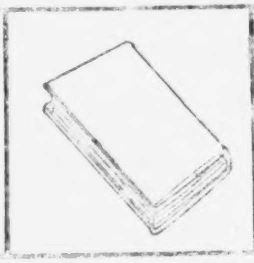
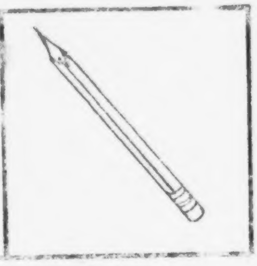
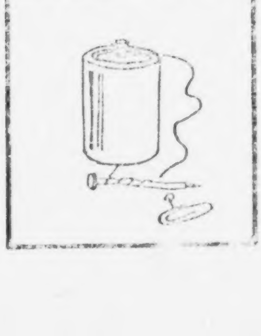
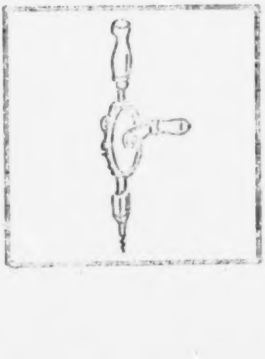
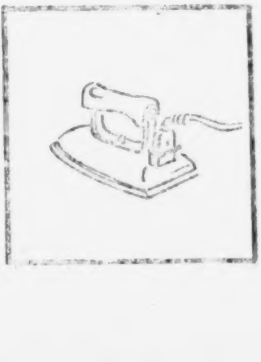
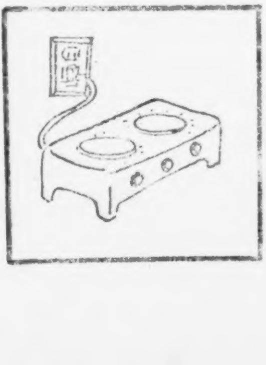










Alumbro las casas
caliento planchas y cocinas
muevo muchas máquinas
ayudo a trabajar.
¿Quién soy?

sol

electricidad

hombre

focos

La parte más importante de muchas máquinas es

la rueda.

el mueble.

la marca.

El sonido viaja por

avión

aire

cartas

The Social-Substantive Schedule

A Language For The Assessment of Congruence Between Operationally Stated Objectives and Instructional Implementation

Robert E. Ribble

and

Charles R. Schultz

The Pennsylvania State University

1968

Revised 1970

The Social-Substantive Schedule is a language of instruction for teachers. We call it a language because it is a collection of relatable words and symbols whose meanings unfold in conceptualizations which can be communicated to others. Many languages of instruction have been developed over the past twenty years to help the student of the instructional process in his search for an explanation and guide to the decision-making process called teaching. If many languages already exist, why then develop another one?

We sought a means to communicate and assess the relationship between a teacher's stated objective and the teaching behaviors chosen to implement different kinds of instructional objectives. The two following prescriptions prompted our search for an effective means for promoting and assessing the competencies they imply:

1. Teachers should be able to describe in operational terms the behavioral changes in students they expect to occur as a result of their instruction.
2. Teachers should choose instructional behaviors that maximize the opportunity for behavioral changes in students congruent with their stated objectives.

In creating the Social-Substantive Schedule we followed the lead of those instructional philogists who had already devised ways of describing the social-emotional climate of the classroom and the substantive-logical import of classroom behavior. While we borrowed freely from the experiences of Ned Flanders, Donald Medley, Harold Mitzel, Hilda Taba, Mary Aschner and a host of others, we are particularly indebted to the work of John Withall and Arno Bellack.

John Withall provided insight about the role played by the social-emotional climate of a classroom in the attainment of various instructional objectives as well as a healthy respect for the parsimonious use of behavior categories in the development of a systematic observation device. He learned from Arno Bellack the importance of the substantive-logical dimension of classroom interaction and its effect on various instructional objectives. The combination of insights about the social-emotional climate and the substantive-logical dimension formed the basis for the schedule of teacher and student behaviors we choose as categories for systematic observation. Consequently, we named our new language the Social-Substantive Schedule.

In answer to the rhetorical question posed earlier, Why develop a new language?, we found no single instrument or combination of instruments that yielded data which could be used for assessing and communicating the idea of congruence between a stated objective and a teachers choice of behaviors to implement the objective. In addition, we wanted a language that could be learned quickly by teachers and could be linked with other aspects of instructional decision making such as the curricular sequencing of objectives.

From the work of Benjamin Bloom, Robert Gagne and Robert Mager, we obtained insights about the construction and classification of instructional objectives. Our language includes the terminology and guidelines set forth by Mager for the construction of instructional objectives. We synthesized their taxonomic work and adopted it to our purposes. Taking the labels for the four classes of instructional objectives. We synthesized their taxonomic work and adopted it to our purposes. Taking the labels for the four classes of instructional objectives from Broudy, Smith and Burnett's four uses of schooling: 1. associative 2. replicative 3. interpretive 4. applicative,[1] we have modified their terms and formed a taxonomy of instructional objectives which is appropriate for our purposes.

Explicit Definitions of Four Types of Objectives

Associative Objectives When a teacher seeks to promote learner self-expression and hypothesis-formation in a setting where verification of learner assertions is not required and is even discouraged we call such an aim as associative objective.

Replicative Objectives When a teacher wants learners to know or comprehend a given fact principle, or theory we say the teacher has a replicative objective. The learners are expected to demonstrate their ability to replicate information given by the teacher.

Interpretive Objectives When a teacher seeks to promote the ability of learners to extrapolate beyond a given set of relationships toward a more sophisticated conceptualization, we say he has an interpretive objective. Here the teacher guides the learner toward predetermined insights.

Applicative Objectives When a teacher seeks to promote the ability of learners to snythesize or evaluate information, we say he has an applicative objective. Given several plausible alternatives the learner is expected to demonstrate his ability to take a position and provide a warrant for his assertions. At the highest level, the learner is even expected to establish alternative solutions to problematic situations he creates.

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[1] Broudy, H., Smith, B. O., and Burnett, W., Democracy and Excellence in American Secondary Education, Rand McNally and Co., 1964, pp. 43-66.

Modes of Instruction

While no two lessons contain exactly the same set of classroom behaviors, it is possible to identify certain recurring general patterns of teacher and student behavior. We call these patterns Modes of Instruction and have identified the following five patterns: 1. lecture 2. recitation 3. guided discovery 4. open exploration and 5. inquiry.[2] Following the presentation of the Social-Substantive Schedule, we will give a behavioral definition of each of these modes of instruction. We believe the following Modes of Instruction are most appropriate for the four types of instructional objectives:

Congruence of Objectives and Modes of Instruction

Instructional Objectives		Modes of Instruction
1. Associative		1. Open Exploration
2. Replicative		2.1 Lecture 2.2 Recitation
3. Interpretive	Examination	3. Guided Discovery
4. Applicative		4. Inquiry

Figure 1

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[2] Note that Guided Discovery and Inquiry are grouped together as examples of an examination Mode. Guided Discovery and Inquiry are defined as separate modes of instruction in the more sophisticated presentation of the Social-Substantive Schedule in Mirrors For Behavior, Simon and Boyer eds., Research For Better Schools, Philadelphia, 1970, pp. 65.1 to 65.22.

In addition to the identification of behavior patterns by means of the Social-Substantive Schedule, we also define the Modes of Instruction in terms of the amount of learner participation in the instructional process. The learner participation rate is determined by the ratio of learner talk to teacher talk.

Modes of Instruction and Learner Participation Rates

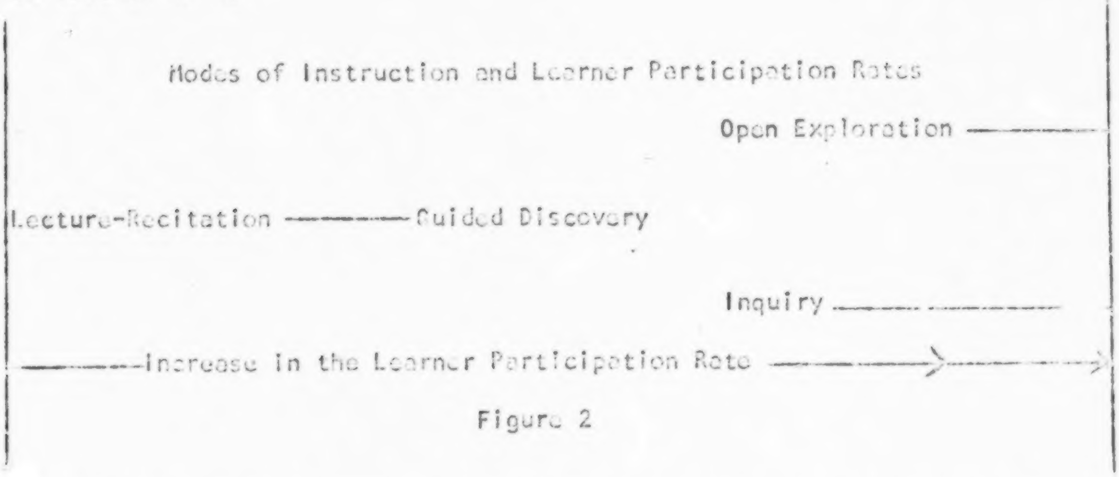

Figure 2

The Social-Substantive Schedule is a set of observable teacher and learner behaviors. From an array of hundreds of observable classroom behaviors, we have chosen twelve categories. By coding classroom behavior in these categories in the sequence of their occurrence, it is possible to make an assessment of the congruence between a stated objective and classroom behavior according to explicit criteria.

The Social-Substantive Schedule

A. Agreement - The intent of these teacher statements is to convey to the learner the teacher's approval of the substance of a learner's assertion.

Examples:

a. Right, Good, Uh huh, Yes, Excellent.

b. That's it exactly

c. I must agree with ry.

B. Student Supportive - The teacher's intent is to commend the learner's effort without approving the correctness of a learner's assertion.

Examples:

a. That was a good try, Mark.

b. Very interesting.

c. Yes, Good, Uh huh, Thank you Denise.

(Note that these same expressions may be used to convey agreement. The observer must decide the dominant intent of the teacher.)

d. You almost have it.

e. Well, that is a good start.

OR

2. Empathizes - The dominant intent of these teacher statements or questions is to accept the feelings expressed by a learner.

Examples:

a. "I know how you feel.

b. Do you want to tell me why you feel so upset?

c. "I had a rough time with those problems too.

C. Eliciting - These are usually teacher questions; however, they occasionally occur in statement form. Their intent is to evoke an assertion from a learner.

Examples:

a. Last week we discussed the Four Noble Truths of Buddhism. What features of Christianity would you say these are comparable to, if any?

b. Do you feel governments in underdeveloped areas should launch programs of birth control?

c. How would you define social class?

D. Examining

1. Explores - The dominant intent of this teacher behavior is the solicitation of more information regarding a learner's original assertion. It is usually a brief question directed to the learner who made the statement who is thereby urged to elaborate upon his previous assertion.

Examples:

a. Why did you say that, John?

b. How do you know?

c. Why?

OR

2. Pursues - This teacher question or statement has the dominant intent of requiring the learner or group of learners to verify a previous statement. The pursuit must call upon the learner to produce evidence or maintain consistency within the presentation of his argument.

Examples:

a. What was there about the Homestead Steel Strike that would support your contention that management provoked it?

b. If you find Negroes unacceptable as neighbors because of their generally low level of education do you feel the restriction of housing to various educational brackets is in accord with democratic principles?

3. Translates - These are teacher responses to learner's remarks which intend to convey to the learner the teacher's desire to understand the substance of a learners assertion. The teacher explicitly or at least implicitly, through non-verbal behaviors, provides a chance for the learner to respond to the translation.

Examples:

a. You seem to be saying that since there are too many loopholes in the progressive income tax law, it should be repealed.

b. Do you mean that Melville spent too much time describing whaling and therefore it is difficult to follow the plot?

c. You think we should group these together?

E. Informs - With this behavior the teacher's intent is to present knowledge to be retained. . This behavior is sometimes initiated by the teacher in the form of a lecture or in response to a learner's question. It can also be a correction of the learner which in no way attempts to belittle or reprove him.

Examples:

a. Danton, Robespierre and Marat were all leaders of the French government during the Reign of Terror.

b. Sociologists claim that a change in one aspect of society ultimately brings changes in every other aspect.

c. No, Dutch attempts to colonize India preceded the French efforts.

F. Neutral - These teacher or learner behaviors carry neither social-emotional nor substantive import. They include verbatim repetition, classroom administrative detail, acknowledgment of a learner who has raised his hand, chit chat, and habitual use of phrases that would otherwise be coded differently such as Right and U huh.

Examples:

a. "These new textbooks are more attractive than I thought they would be.

b. There will be a brief interruption of today's class while the principal makes an announcement.

c. "Yesterday e talked about Jackson and the pet banks.

d. For tomorrow's discussion you may want to read the first section of Chapter Seven.

e. Steve. (Calling on a learner who has raised his hand when no question has been given.)

f. Gravity (A verbatim repetition of a learner response by the teacher.)

G. Directing - These teacher behaviors either shape the learner's social activity or restrict the nge of his expression to the limits the teacher desires. Their intent is to insist that the learner assume or maintain the teacher's view. They do not allow for the expression of alternatives by the learner. In their more extreme form, t y carry a measure of threat.

Examples:

a. "Please shut your books and answer the questions I have prepared."

b. In this class we will accept the cycles of political revolution as described by Crance Brinton.

c. Pay attention!

d. Take a moment and think about this.

H. Reproving and Definsive

1. Reproving - The dominant intent of this behavior is to punish a learner or the class as a whole for what the teacher perceives as a breach of proper conduct. Often as insult or sarcasm, these statements belittle or denegrate the learner they express the teacher's disapproval of his ideas or acts.

Examples:

a. I'll tell you why you can't answer the question. This is the third day in a row that you didn't read the assignment Samantha.

b. Joan if you don't stop bugging Celia you'll have to go to the office.

c. Where in the world did you dig up that idea.

d. For an eleventh grader that's a lousy answer.

OR

2. Defensive - With this behavior the teacher intends to justify or defend himself. In a mild form it is expressed as an apology. At other times it is an appeal to the teacher's

authority when he can no longer defend his position on substantive grounds. More blatantly the teacher excuses himself for his failures by shifting the burden of responsibility to the learner or to some external source. Sustaining behaviors are often made in response to a real or imagined threat.

Examples:

a. I don't have this kind of trouble with my other classes.

b. I'm not very good at this but I'll try to draw the map on the board.

c. I've had much more training and experience in this test. I went over it at least a half-dozen times.

Student Behaviors

I. Compliance - This learner behavior is a direct response to the teacher's efforts to elicit or examine. The teacher has requested a response from a particular learner and the learner compiles.

Examples: The following excerpt from a transcript shows three cases of learner compliance.

(g) Teacher: Ellen what did we say was an important industry in England affected by the Industrial Revolution?

(l) Ellen: Textiles

(G) Teacher: Why do you think the textile industry was so affected?

(I) Ellen: I guess it was the biggest industry at the time.

(G) Teacher: Why would size be important?

(I) Ellen: Well, they would have more money to invest.

J. Volunteering - The teacher has provided the occasion for a learner response by posing a question to the class in general. The learner chooses to participate on a voluntary basis.

Examples: The following excerpt contains two examples of learner volunteering (J) Note that the second teacher statement has a double intent and each intent unit is coded separately.

(C) Teacher: What are the two ways a culture can change? (Pause . . . Bill raises his hand) Bill.

(J) Bill: Diffusion and innovation

(A-C) Teacher: Good. Which do you think accounts for most of the change in a culture?

(J) Bill: Diffusion

K. Pursuing - This learner behavior is related to a previous question or assertion by either the teacher or a fellow learner. It is not solicited by the teacher. It is a spontaneous effort by a learner to explore or pursue a prior question or assertion. Note that a learner's request that the teacher or a fellow learner repeat a question would be coded (L) procedural and not (K).

Examples: The following transcript contains three examples of learner pursuing. Examples of other learner behaviors are included to help distinguish them from pursuing.

(C) Teacher: In considering the failure of the League of Nations, how potent a factor was the American refusal to join? (Pause . . . Bill raises his hand.) Bill.

(J) Bill: It was the most important factor. The whole idea was Wilson's and then we didn't even join and we were the most powerful country.

(K) Joan: Bill wouldn't the growth of Russian and German economic and military strength have caused a conflict the League couldn't solve whether we were in it or not?

(K) Bill: If there was a conflict it wouldn't mean that the League would end would it?

(K) Joan: Are we talking about why the League stopped operating or why the League failed? (Addressed to the teacher)

(D) Teacher: Are these two matters that can be separated?

(L) Bill: I don't understand your question. Would you say that again?

L. Procedural - All learner verbal behaviors that are not cases of compliance, volunteering or pursuing are categorized as procedural.

Examples:

a. What page did you want us to turn to?

b. Are you going to the football game tonight?

c. May I open a window back here?

Analysis of the Record of Classroom Behavior

The Social-Substantive Schedule can be used by highly trained observers to code live classroom behavior or it may be used by less trained persons in conjunction with a tape recording of a classroom session. The tape recording relieves the pressure of rapid categorization and allows for repetition until a judgment of intent can be reached. Of course, a videotape recording provides even more evidence for making judgments because it augments the verbalizations with a host of non-verbal cues.

After coding a classroom session live, with conventional audiotape or with videotape, the observer determines the ratio of teacher to student talk, and classifies the mode or modes of instruction observed with the following interpretation criteria:

Social Substantive Schedule

Teacher Behaviors

A. Agreement

B. Student Supportive

C. Eleciting

D. Examining

E. Informing

F. Neutral

G. Director

H. Reproving and defensive

Student Behaviors

I. Compliance

J. Volunteering

K. Pursuing

L. Procedural

Interpretation Criteria

Lecture - Recitation

1. More than 60% of total behavior in Cat. C-E-G-I-J
2. Less than 15% of total behavior in Cat. D

Examination

1. More than 15% of total behavior in Cat. D-K
2. More than 20% of total behavior in Cat. J-K
3. Less than 8% of total behavior in Cat. G-I
4. Less than 2% of total behavior in Cat. K
5. Less than 20% of total behavior in Cat. E
6. Less than 10% of total behavior in Cat. A

Open Exploration

1. More than 7[illegible] of total behavior in Cat. C-J
2. Less than 5% of total behavior in Cat. G-I
3. Less than 2% of total behavior in Cat. H

Selected References

Bellack, Arno, The Language of the Classroom, Cooperative Research Project, No. 2023, Institute of Psychological Research, Teachers College, Columbia University, 1963.

Broudy, Hary S., Smith, B. O., and Burnett, J. R., Democracy and Challenge in American Secondary Education, Chicago, Rand McNally, 1964.

Gagne, Robert M., Curriculum Research and the Promotion of Learning, Monographs on Curriculum Research and Evaluation, Chicago: Rand McNally, American Educational Research Association, 1967.

______________, The Learning Requirements for Enquiry, Journal of Research in Science Teaching, Vol. 10, 1963.

Gagne, R. M., and Brown, L. T., Some Factors in the Programming of Conceptual Learning, Journal of Experimental Psychology, LXII, 1961.

Mager, R. F., Preparing Instructional Objectives, Palo Alto, California: Fearon Publishers, 1962.

Smith, B. O., and Meux, Milton, A Study of the Logic of Teaching, Cooperative Research Program, Project No. 258 (7257), Urbana, Bureau of Educational Research, College of Education, University of Illinois, 231.

Withall, John, The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms. unpublished Ph.D. dissertation, University of Chicago, Chicago, 1948.

______________. A Symposium on Conceptual Frameworks for Analysis of Classroom Social Interaction, Journal of Experimental Education, Vol. 30, No. 4, June, 1962.